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CLAIMS

[Claim(s)]

[Claim 1] A controlled-system circumference information detection means to detect the information on the controlled-system circumference, and a controlled-system self-information detection means to detect self-information of a controlled system own [said], A feeling quantity of state decision means to determine the feeling quantity of state which expressed numerically the condition of two or more kinds of feeling set up beforehand, respectively based on said circumference information and said self-information, Activity decision equipment characterized by having a controlled-system activity decision means to determine the activity of said controlled system based on said all feeling quantity of states.

[Claim 2] Said feeling quantity of state decision means is activity decision equipment according to claim 1 characterized by determining that said feeling quantity of state will become a bigger numeric value than the time when the direction when it is strong is weak according to the strength of said feeling.

[Claim 3] Said controlled-system activity decision means is activity decision equipment given in claim 1 characterized by determining said activity based on this amount of feeling experiences while accumulating said feeling quantity of state determined by the time it resulted from the predetermined past now for every class of said feeling, respectively and determining the amount of feeling experiences, or any 1 term of 2.

[Claim 4] Said controlled-system activity decision means is activity decision equipment given in claim 1 characterized by determining said activity based on this feeling variation while computing the variation of said feeling quantity of state for every class of said feeling, respectively and determining feeling variation, or any 1 term of 2.

[Claim 5] While said controlled-system activity decision means accumulates said feeling quantity of state determined by the time it resulted from the predetermined past now for every class of said feeling, respectively and determines the amount of feeling experiences Activity decision equipment given in claim 1 characterized by computing the variation of said feeling quantity of state for every class of said feeling, respectively, determining feeling variation, and determining said activity based on said feeling quantity of state, said amount of feeling experiences, and said feeling variation, or any 1 term of 2.

[Claim 6] For said every activity of two or more classes beforehand set as said controlled system The numeric value showing extent of the relation of each of said feeling and this activity is set up as a feeling multiplier. Said controlled-system activity decision means While determining the activity consideration reinforcement which expressed numerically

the strength of the consideration for said controlled system to perform said activity, based on said feeling quantity of state and said feeling multiplier for said every activity Activity decision equipment given in claim 1 characterized by determining the activity of said controlled system based on this activity consideration reinforcement, or any 1 term of 2.

[Claim 7] For said every activity of two or more classes beforehand set as said controlled system The numeric value showing extent of relation is set up as a feeling multiplier in each and this activity of said feeling. Said controlled-system activity decision means While determining the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform said activity, based on said amount of feeling experiences, and said feeling multiplier for said every activity Activity decision equipment according to claim 3 characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[Claim 8] For said every activity of two or more classes beforehand set as said controlled system The numeric value showing extent of the relation of each of said feeling and this activity is set up as a feeling multiplier. Said controlled-system activity decision means While determining the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform said activity, based on said feeling variation and said feeling multiplier for said every activity Activity decision equipment according to claim 4 characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[Claim 9] For said every activity of two or more classes beforehand set as said controlled system The numeric value showing extent of the relation of each of said feeling and this activity is set up as a feeling multiplier. Said controlled-system activity decision means While determining the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform this activity, based on this feeling multiplier, said feeling quantity of state, said amount of feeling experiences, and said feeling variation for said every activity Activity decision equipment according to claim 5 characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[Claim 10] Said controlled-system activity decision means is activity decision equipment given in any 1 term of claims 3, 5, 7, and 9 characterized by comparing with a predetermined threshold said feeling quantity of state determined by the time it resulted [from the predetermined past] in current, and the direction of said feeling quantity of state making total time amount said amount of feeling experiences in succession than said threshold while it is large.

[Claim 11] difference with the predetermined value which set up said controlled-system activity decision means beforehand with said feeling quantity of state -- every class of said feeling -- computing -- this -- activity decision equipment given in any 1 term of claims 3, 5, 7, and 9 characterized by accumulating difference and determining said amount of feeling experiences.

[Claim 12] Said controlled-system activity decision means is activity decision equipment given in any 1 term of claim 6 characterized by updating said feeling multiplier - claim 9 based on said feeling quantity of state.

[Claim 13] It is activity decision equipment given in claim 7 characterized by for said controlled-system activity decision means comparing with a predetermined threshold said amount of feeling experiences determined to said feeling of a specific class, and

determining the activity of said controlled system as a specific thing when this amount of feeling experiences is larger than said threshold, or any 1 term of 9.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the activity decision equipment which determines the activity which the controlled system which has two or more kinds of feeling performs based on the condition of feeling.

[0002]

[Description of the Prior Art] Conventionally, for example, when a controlled system is the pet mold robot which has three feeling, "sadness", "joy", and the "resentment" The condition of the circumference which surround pet mold robots, such as brightness, silence, etc. around actuation and around [a user's expression or], is detected. And the condition at the time of being touched by the user ("struck") and a pet mold robot's own conditions, such as a hungry condition (residue of a cell), were detected, and the condition was numerically determined for every class of feeling based on these detection results. ["it was stroked",] And although it was conspicuous, its attention was paid for seeing, and the activity which a pet mold robot is made to perform by choosing the activity relevant to the feeling which is the numerical description among each feeling from the candidates who have set up beforehand was determined.

[0003]

[Problem(s) to be Solved by the Invention] However, by the above-mentioned conventional approach, in the time of, for example, a favorite user appearing suddenly in front of the pet mold robot by which the feeling of "joy", "dislike", and "surprise" was set up, and the time of a disagreeable user appearing, as for the former, the feeling of "joy" and "surprise" goes up, and the feeling of "dislike" descends. Moreover, the feeling of "dislike" and "surprise" will go up, and, as for the latter, the feeling of "joy" will descend. However, without doing what the actuation of "being surprised" is only returned, or "it is [a thing] surprised" when the feeling which went up most is "joy", and "dislike", since actuation to the feeling of the condition strongest against a pet mold robot is conventionally carried out to these both, for a user, such as "it dances", and "escaping" etc., it is dissatisfied and there is a possibility may return the actuation which lacked in interest.

[0004] moreover, a user -- a pet mold robot -- receiving -- ->["to stroke"] "it strikes" -> -
- when actuation of "stroking" is performed continuously, activity is determined to that
which is characteristic among the conditions of the feeling at that time for every
actuation. that is, the feeling to which the condition of feeling went up greatly and, as for
feeling, these-went up in order of "joy" ->"dislike" -> "joy" -- receiving -- the -- ** --
activity determined that it comes and will move aside will be performed. being [that /
right], then ->["is danced"] "it escapes" -> -- in order to return the reaction to the
condition of the feeling at the time of [each] the condition of front feeling being
disregarded in the order of "dancing", a user becomes possible [predicting comparatively
the activity accompanying change and it of a pet mold robot's feeling for a short period of
time]. [pet mold robot] Consequently, as a pet mold robot, it is easy to get bored and
there is a possibility of sensing as what lacked in interest.

[0005] Then, this invention is made paying attention to the unsolved technical problem
which such a Prior art has. By being able to determine suitable activity to the complicated
feeling condition with which two or more feeling mingled, and taking into consideration
the variation of the condition of the past feeling, or the condition of feeling It aims at
offering the activity decision equipment which can carry out actuation concerning the
past experience, actuation in which positiveness is impressed to a controlled system.

[0006]

[Means for Solving the Problem] In order to attain the above-mentioned object, the
activity decision equipment according to claim 1 concerning this invention A controlled-
system circumference information detection means to detect the information on the
controlled-system circumference, and a controlled-system self-information detection
means to detect self-information of a controlled system own [said], A feeling quantity of
state decision means to determine the feeling quantity of state which expressed
numerically the condition of two or more kinds of feeling set up beforehand, respectively
based on said circumference information and said self-information, It is characterized by
having a controlled-system activity decision means to determine the activity of said
controlled system based on said all feeling quantity of states.

[0007] That is, own self-information of a controlled system, such as contact status
information when the camera which detects the visual information on a controlled system
besides being the speech information of the controlled-system circumference, light-and-
darkness information, temperature information, etc. with a controlled-system
circumference information detection means detecting a user's expression, the existence of
actuation and an obstruction, etc., and being contacted by the attitude information of a
controlled system, hungry information (dc-battery residue), and the user with a
controlled-system self-information detection means, is detected. And a feeling quantity of
state decision means determines numerically the condition of two or more kinds of
feeling, such as "joy" beforehand set as the controlled system based on such information,
and "resentment." Furthermore, decision of a feeling quantity of state determines the
activity which a controlled system is made to perform with a controlled-system activity
decision means based on the feeling quantity of state of the feeling of these all class.

[0008] For example, when a controlled system is used as a pet mold robot, the
circumference information and self-information of a controlled system which were
described above with the controlled-system circumference information detection means
and the controlled-system self-information detection means are detected first. The change

value of the feeling quantity of state of each feeling is beforehand set here to all the information that may be detected. When the feeling quantity of state of each synthetic feeling is determined by the same thing to do for feeling addition and "it is stroked" by the user, these change value. As it said that "+50" was added to the quantity of state of "joy", and "-20" was added to the quantity of state of the "resentment". Lifting of a certain feeling sets up making it a value to which the feeling which becomes symmetrical descends etc. so that change characteristic of the quantity of state of the feeling relevant to each information detected may be carried out. and -- or it determines activity to the computed synthetic feeling quantity of state -- or -- further -- a hand -- in addition -- for example, the operation changed into one numeric value which included all feeling is carried out, and the content of action is determined to the result. Thus, if the content of action is determined based on all feeling, when "a pleasant thing" and "a painful thing" happen to a pet mold robot simultaneously, as opposed to the complicated feeling to which both the quantity of states of two feeling that "joy" and "sadness" conflict rose, it will become possible for a user to make a pet mold robot perform actuation with difficult prediction actually ["he is absent-minded" etc.].

[0009] Moreover, invention concerning claim 2 is characterized by said feeling quantity of state decision means determining that said feeling quantity of state will become a bigger numeric value than the time when the direction when strong is weak according to the strength of said feeling in activity decision equipment according to claim 1. That is, the strong one expresses the quantity of state of the feeling of changing to the information detected, for a bigger numeric value than the weaker one to the strength of feeling.

[0010] For example, when this activity decision equipment is applied to the pet mold robot by which the feeling of "joy" and "sadness" was set up, if [this robot / each of a favorite user and an ordinary user] "Stroked" It becomes possible by in the case of a favorite user, expressing the degree of "joy" in numerical magnitude, as it was called "+20", when the quantity of states of "joy" were "+80" and an ordinary user to attain differentiation with a favorite user and an ordinary user. Moreover, since these two feeling conflicts when the quantity of state of "joy" and "sadness" is determined as "70" and "50" by determining a feeling quantity of state in this way, respectively, it also becomes possible to determine the content of action which performs the count "70-50=20", re-determines the quantity of state "20" of "joy", and suits to this numeric value.

[0011] Moreover, while accumulating said feeling quantity of state as which invention concerning claim 3 was determined in activity decision equipment given in claim 1 or any 1 term of 2 by the time said controlled-system activity decision means resulted from the predetermined past now for every class of said feeling, respectively and determining the amount of feeling experiences, it is characterized by to determine said activity based on this amount of feeling experiences.

[0012] That is, a controlled-system activity decision means adds the feeling quantity of state determined by the present from the predetermined past for every class of feeling, calculates the synthetic numeric value (the amount of feeling experiences) of each feeling, and determines activity based on this amount of feeling experiences. For example, when this activity decision equipment was applied to the pet mold robot by which the feeling of "joy" and "sadness" was set up and the feeling quantity of state of "joy" changes with "20" -> "-100" -> "80", the amount of feeling experiences of "joy" is set to "20+(-100)+80=0." Moreover, when the feeling quantity of state of "sadness"

changes with "-20" → "100" → "-80", the amount of feeling experiences of "sadness" is set to $+(-20)100+(-80)=0$, and the content of action will be determined based on these amounts of feeling experiences. That is, although a change strong against the condition of "joy" had broken out, since current had a change strong against the feeling of "sadness" which disagrees with "joy" in the past in front of one, the feeling quantity of state of "joy" is set to "-100", it denies each other "20" which is a feeling quantity of state before and behind that, and "80", and the amount of feeling experiences has become "0."

Similarly, in the case of the feeling of "sadness", the feeling quantity of state of the past in front of one is "100", denies "-20" which is a feeling quantity of state before and behind that, and "-80" mutually, and the amount of feeling experiences has become "0."

Therefore, since it is in the condition which does not have change in feeling (the amount of feeling experiences is 0), it is determined activity "will be absent-minded." Thus, since activity is determined also in consideration of the condition of the past feeling by taking the sum of a feeling quantity of state, even if the feeling of current "joy" is in a strong condition, it becomes possible, when the feeling of "sadness" is in a strong condition immediately before to avoid unnatural actuation of "dancing" and to determine suitable activity. Here, although the thing of the value of "minus" is used for the feeling quantity of state, a feeling quantity of state may be set up so that it may not become below "0", and may carry out computing the difference of the amount of feeling experiences of "joy" and "sadness" for which it asked on this condition and which are opposite feeling etc.

[0013] Moreover, in activity decision equipment given in claim 1 or any 1 term of 2, invention concerning claim 4 is characterized by determining said activity based on this feeling variation while it computes the variation of said feeling quantity of state as which said controlled-system activity decision means was determined in the predetermined past and the present for every class of said feeling, respectively and determines feeling variation.

[0014] That is, it asks for the degree of change of a feeling quantity of state by computing the difference of the feeling quantity of state in the predetermined past of a controlled system, and a current feeling quantity of state. For example, if this activity decision equipment is applied to the pet mold robot by which the feeling of "joy" was set up Although it is set to "20" and "80", respectively and the feeling quantity of state after change is the same if the difference is computed when the feeling quantity of state of "joy" changes to "80" "20" → "100" with the case where it changes to → "100", a difference produces fairly the variation which is the difference in the magnitude. And by making a pet mold robot perform reaction actuation which is different from the actuation to the usual "joy" when variation is "80" For example, a pet mold robot's reaction can be made into what [different] by the case "where it is stroked by the favorite user", and the case "where it is stroked by the ordinary user", both differentiation can be attained; and it becomes possible to make attachment to a pet mold robot easy to give a user.

[0015] Moreover, it is also possible to give a pet mold robot autonomy at reverse, as positive actuation of "a tail being wagged and approaching" is carried out so that actuation which raises the feeling quantity of state of "joy" to a user to a pet mold robot may be carried out, if the condition of "joy" has a slight change when the condition over "joy" of for example, a pet mold robot is weak.

[0016] Invention concerning claim 5 is set to activity decision equipment given in claim 1 or any 1 term of 2. Moreover, said controlled-system activity decision means While

accumulating said feeling quantity of state determined by the time it resulted from the predetermined past now for every class of said feeling, respectively and determining the amount of feeling experiences It is characterized by computing the difference of said feeling quantity of state determined in the predetermined past and the present for every class of said feeling, respectively, determining feeling variation, and determining said activity based on said feeling quantity of state, said amount of feeling experiences, and said feeling variation.

[0017] That is, first, the quantity of state of feeling is determined, a feeling quantity of state until it next results from the predetermined past now is accumulated for every feeling, the amount of feeling experiences is determined, the variation of the feeling quantity of state of the further predetermined past and the present is computed, and feeling variation is determined. And a controlled-system activity decision means determines activity based on all these feeling quantity of states, the amounts of feeling experiences, and feeling variation. Therefore, it is complicated, and since it becomes difficult by carrying out the multi-statement of the activity corresponding to these since the condition of feeling with a touch of reality is set up for a user to guess the condition of feeling and the activity to the condition, manufacture of the pet mold robot with which it is hard to get bored, and attachment tends to spring is attained.

[0018] For example, if this activity decision equipment is applied to the pet mold robot by which the feeling of "joy" and "sadness" was set up When the feeling quantity of state of "joy" changes with "20" -> "30" -> "50" and the feeling quantity of state of "sadness" changes with "30" -> "10" -> "20" Since the feeling quantity of state of "sadness" of the current feeling quantity of state of "joy" is "20" in "50", "100", "60", and feeling variation are computed for the amount of feeling experiences with "50" and "10", respectively. The difference of each feeling quantity of state with "sadness" which is the feeling which disagrees with "joy" when determining activity from these numeric values, the amount of feeling experiences, and feeling variation is computed. If it does so, a feeling quantity of state "30", the amount of feeling experiences "40", and feeling variation "40" can be found, respectively, and will determine a pet mold robot's feeling as a thing with a touch of reality by determining the numeric value which deducted each numeric value of these "sadness" from each numeric value of "joy", respectively as a numeric value of true "joy." And for example, since the numeric values previously calculated from this numeric value are "30", "40", and "40" supposing the average of each numeric value of the feeling quantity of state, the amount of feeling experiences, and feeling variation to the feeling of "joy" is "50", the activity to "joy" a little more nearly negative than the actuation performed to the average will be determined.

[0019] Moreover, according to invention concerning claim 6, it sets to activity decision equipment given in claim 1 or any 1 term of 2. The predetermined numeric value which associates all and this activity of said feeling for said every activity of two or more classes beforehand set as said controlled system is set up as a feeling multiplier. While said controlled-system activity decision means determines the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform said activity based on said feeling quantity of state and said feeling multiplier for said every activity It is characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[0020] That is, suppose that the activity of "it is glad", "it feeling sad", "observing", etc.

is set up, and three, "joy", "sadness", and the "resentment", are set up as feeling as opposed to a controlled system. First, if a feeling quantity of state is determined as "5" to the feeling of "10" and the "resentment" to the feeling of "30" and "sadness" to the feeling of "joy". A feeling multiplier receives the feeling of "joy" to the activity of "being glad". For example, "+10", If this multiplier is integrated, respectively with each feeling quantity of state of "joy", "sadness", and the "resentment" when being set up with "-10" to the feeling of "-10" and the "resentment" to the feeling of "sadness", respectively for example To "joy", the numeric value of "-50" is computed to "-100" and the "resentment" to "300" and "sadness", respectively. And for example, the numeric value "150" is computed to $(300 + (-100) + (-50) = 150)$ and the activity of "being glad" by adding these addition results. Here, this numeric value serves as activity consideration reinforcement. [0021] Thus, it becomes possible by adding, after integrating, as each feeling multiplier and a corresponding feeling quantity of state were described above, or starting a diploid value by other operations to tie up the feeling and each activity of all classes. Supposing it also receives "it feels sad" and "it observing" similarly and is set as the feeling that a feeling multiplier is three, "joy", "sadness", and the "resentment", with -7, "10, 5", and "0, 5, 0", respectively, activity consideration reinforcement will be computed with "-85" and "50", respectively. Therefore, to activity "it is glad", it receives "150" and "it feeling sad", receives "-85" and "it observing", and "50" is determined as activity consideration reinforcement, respectively.

[0022] And in case activity is determined actually, the magnitude of these activity consideration reinforcement is compared, respectively, and it being decided that it will be the activity of the largest numeric value, or making a controlled system perform specific activity etc., when the activity consideration reinforcement to specific activity is [more than / for example, / more than below "100" or "500"] sets up the predetermined conditions of determining activity, and it determines it according to the condition, for example.

[0023] A feeling multiplier is a numeric value which associates the activity set up beforehand and each feeling here, for example, it receives "it being glad". When the feeling quantity of state of "joy" is large, [of activity] The big value of the sign of "plus" is set up as a feeling multiplier so that this activity may become is easy to be chosen, and it is set as the big value of the sign of "minus" so that "it is glad" may not be chosen as reverse to the feeling of "sadness", when this feeling quantity of state is large. [of activity] If it does in this way, when the feeling quantity of state of "joy" is [the quantity of state of "50" and "sadness"] "20", it receives "it being glad". A feeling multiplier to the feeling of "joy" "+10", [of activity] When set as the feeling of "sadness" with "-8", activity consideration reinforcement If it is the same calculation approach as the above, will be set to "340", and when the feeling quantity of state of "joy" is [the feeling quantity of state of "20" and "sadness"] "50" Since the activity consideration reinforcement which receives "it being glad" is set to "-200", when determining as activity to which a controlled system performs the largest thing of this numeric value, as for the former, "to be glad" is easy to be chosen, and the latter becomes that it is hard to be chosen. [of activity]

[0024] Moreover, according to invention concerning claim 7, it sets to activity decision equipment according to claim 3. The predetermined numeric value which associates said feeling and this activity for said every activity of two or more classes beforehand set as

said controlled system is set up as a feeling multiplier. While said controlled-system activity decision means determines the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform said activity based on said amount of feeling experiences, and said feeling multiplier for said every activity It is characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[0025] To above-mentioned claim 3, like the activity decision equipment of a publication that is, with a controlled-system activity decision means Based on each detected information, determine the amount of feeling experiences of each feeling, and the amount of experiences of each feeling and a corresponding feeling multiplier are integrated for every activity like the activity decision equipment of a publication to above-mentioned claim 6, for example. Furthermore, activity consideration reinforcement is determined by adding the result. In this case, since the feeling multiplier is integrated to the amount of feeling experiences, the activity consideration reinforcement in consideration of a feeling quantity of state until it results [from the predetermined past of a feeling quantity of state] in current will be determined. Therefore, since the feeling which had many conditions that a feeling quantity of state was large, in the past is reflected in activity consideration reinforcement Even if it is a numeric value with the big feeling quantity of state of current "joy", when the feeling quantity of state of a big numeric value is continuing being determined as immediately before to "sadness" Since the activity consideration reinforcement to activity, such as "dancing", serves as a small value and the activity consideration reinforcement to activity, such as "falling", serves as a big value, unnatural activity is avoided and it becomes possible to determine suitable activity.

[0026] Moreover, according to invention concerning claim 8, it sets to activity decision equipment according to claim 4. The predetermined numeric value which associates said feeling and this activity for said every activity of two or more classes beforehand set as said controlled system is set up as a feeling multiplier. While said controlled-system activity decision means determines the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform said activity based on said feeling variation and said feeling multiplier for said every activity It is characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[0027] That is, like activity decision equipment given in above-mentioned claim 4, the variation of the feeling quantity of state of each feeling of the predetermined past and the present is computed, feeling variation is determined, and like activity decision equipment given in above-mentioned claims 6 and 7, each feeling variation and a feeling multiplier are integrated for every activity, and activity consideration reinforcement is determined by adding the calculation result further. In this case, since the feeling multiplier is integrated to feeling variation, the activity consideration reinforcement in consideration of the degree of change of a feeling quantity of state will be determined. When there is an abrupt change of feeling, a big change will arise about activity consideration reinforcement. Therefore, for example, the feeling of "joy" and "sadness", When this activity decision equipment is applied to the pet mold robot by which "it dancing" and "its head is hung" were set up, [of activity] Supposing the feeling quantity of state of "joy" changes to "30" -> "50" and the feeling quantity of state of "sadness" changes to "10" -> "50", the variation For example, if the difference of the feeling quantity of state

of change before and the back is taken, it will be set to "20" and "40", respectively, and the direction of the feeling of "sadness" will serve as big variation. "in this case, activity - its head is hung, saying" "it dances" -- receiving -- a feeling multiplier -- respectively -- the feeling of "joy" and "sadness" -- receiving -- "10, -6" -- and -- ", supposing it is set up with -6 and 10" Since activity consideration reinforcement receives "it dances", receives "-40" and "its head being hung" and computed with "440" Supposing it is the decision approach by which the largest thing of this numeric value is determined as activity which a pet mold robot performs, it is the numeric value as which the direction of "hanging one's head" which is the activity relevant to the feeling of great "sadness" of variation is easy to be determined. Thus, it becomes possible to make actuation like a conditioned reflex of being able to withdraw a hand quickly [when that of a heat potato is touched suddenly] by making it easy [the activity concerning the large feeling of the variation of a feeling quantity of state] a lifting into a controlled system. However, detection of contact temperature is needed as self-information in this case.

[0028] Moreover, according to invention concerning claim 9, it sets to activity decision equipment according to claim 5. The predetermined numeric value which associates said feeling and this activity for said every activity of two or more classes beforehand set as said controlled system is set up as a feeling multiplier. While said controlled-system activity decision means determines the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform this activity based on this feeling multiplier, said feeling quantity of state, said amount of feeling experiences, and said feeling variation for said every activity It is characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[0029] That is, the feeling quantity of state, the amount of feeling experiences, and feeling variation of each feeling are determined as above-mentioned claim 5 to each detected information like the activity decision equipment of a publication. Moreover, like activity decision equipment given in above-mentioned claims 6-8, a feeling quantity of state, the amount of feeling experiences and feeling variation, and a feeling multiplier are integrated for every activity, and activity consideration reinforcement is determined by adding the calculation result further. In this case, since a feeling quantity of state, the amount of feeling experiences and feeling variation, and a feeling multiplier are integrated, activity consideration reinforcement will be determined in consideration of hysteresis until it results [from the condition of current feeling, and the past of a feeling quantity of state] in current, and the degree of change of a feeling quantity of state. Here, a feeling multiplier sets up a respectively different thing to a feeling quantity of state, the amount of feeling experiences, and feeling variation. For example, if this activity decision equipment is applied to the pet mold robot by which "it dances" was set up as activity and "joy" and "sadness" were set up as feeling First, if "80, 20", and feeling variation are determined for "30, 5", and the amount of feeling experiences as "20, 0", respectively, the feeling quantity of state of "joy" and "sadness", respectively Receive "it dancing" and "5, -2", and a feeling multiplier are set as the feeling of "joy" and "sadness" to the feeling quantity of state. [of activity] Supposing it is set up with "5, -5" to "3, -3", and feeling variation to the amount of feeling experiences, similarly activity consideration reinforcement To "140" and the amount of feeling experiences, it is set to "100" to "180" and feeling variation to a feeling quantity of state, and in these, by adding

all, synthetic activity consideration reinforcement is computed as "140+180+100=420", and is determined. In this case, the magnitude of the feeling [reinforcement / activity consideration] quantity of state at that event, It becomes the numeric value in which all the properties of the hysteresis of a feeling quantity of state until it results [from the past] in current, and the variation of a feeling quantity of state were included. Since it becomes the activity consideration reinforcement corresponding to the condition of feeling more complicated than the activity consideration reinforcement which used and computed each of a feeling quantity of state at present, the amount of feeling experiences, and feeling variation alone By setting up much activity corresponding to these conditions, it becomes possible to determine the activity which is rich in versatility and has a touch of reality.

[0030] According to invention concerning claim 10, it sets to activity decision equipment given in any 1 term of claims 3, 5, 7, and 9. Moreover, said controlled-system activity decision means It is characterized by comparing said feeling quantity of state determined by the time it resulted [from the predetermined past] in current with the predetermined threshold set up beforehand, and the direction of said feeling quantity of state making total time amount said amount of feeling experiences in succession than said threshold, while it is large.

[0031] That is, it is what made total time amount while this quantity of state is over the predetermined threshold among the feeling quantity of states determined by the time it resulted [from the past] in current the amount of feeling experiences, even if there is what has a large feeling quantity of state in single shot in this case, it is ignored, and that amount of feeling experiences serves as as big a value as the feeling that the condition of the magnitude beyond a threshold continues for a long time. For example, suddenly, when the feeling quantity of state of "joy" continues for a long time above the threshold, since the amount of feeling experiences serves as a big value to "joy" even if the feeling quantity of state of "sadness" has a big change, the condition of the big feeling of "sadness" at present will be eased by the amount of feeling experiences of "joy", or it will be denied. Therefore, since it becomes a value with the big amount of feeling experiences as it described above, when the feeling quantity of state of the magnitude beyond a threshold followed reverse in the past and it was determined, although it did not become a value with the big amount of feeling experiences even if there was change of the feeling [that it is big in the past] quantity of state in single shot, and it did not have big effect about activity consideration reinforcement etc., it influences also in the decision of activity consideration reinforcement strongly. Therefore, it becomes possible to determine the activity by which the condition of the past feeling was reflected in the controlled system by setting a threshold as a suitable value and adjusting activity consideration reinforcement etc.

[0032] moreover, difference with the predetermined value which set up said controlled-system activity decision means beforehand with said feeling quantity of state in activity decision equipment given in any 1 term of claims 3, 5, 7, and 9 according to invention concerning claim 11 -- every class of said feeling -- computing -- this -- it is characterized by accumulating difference and determining said amount of feeling experiences. That is, difference with predetermined values, such as a feeling quantity of state determined by the time it resulted [from the predetermined past] in current, initial value of each feeling, or the average, is computed, and the amount of feeling experiences is determined by

accumulating this difference. In this case, unlike a case so that it may decide on the total time amount which is over the threshold in succession [by the time it results / from the predetermined past / in current like activity decision equipment given in above-mentioned claim 10] as the amount of feeling experiences, difference with a predetermined value is taken to all the target feeling quantity of states. For example, when a predetermined value is made into the average, having used the lower limit of difference as "0", since only that to which the feeling quantity of state exceeded the average serves as a bigger value than "0", it will accumulate, and all the feeling quantity of states below the average are disregarded. Therefore, when the thing beyond the average has many feeling quantity of states of each feeling, the amount of feeling experiences serves as a big value, and affects the decision of activity consideration reinforcement etc. Even if the feeling of "joy" will be in a strong condition suddenly after the strong condition of the feeling of "sadness" continues for a long time for example, since the element of the feeling that many feeling quantity of states big in the past were determined to activity consideration reinforcement etc. by carrying out like this is reflected strongly, it becomes possible for unsuitable activity, such as "dancing", to be made not to be determined with the amount of feeling experiences of sadness.

[0033] Moreover, according to invention concerning claim 12, in activity decision equipment given in any 1 term of claim 6 - claim 9, said controlled-system activity decision means is characterized by updating said feeling multiplier based on said feeling quantity of state. That is, predetermined conditions are set up as opposed to the feeling quantity of state, and when the feeling quantity of state of the target feeling becomes the value with which the condition is filled, the multiplier value over the feeling with which the conditions of each feeling multiplier set up for every activity were filled is updated.

[0034] Moreover, it is the renewal of a feeling multiplier increasing the multiplier value of the feeling with which conditions' were filled, and strengthening the connection with the feeling and activity. [whether when the feeling quantity of state of the feeling rises, it is made for activity with the strong feeling and connection to become that it is easy to be determined, and] Or a multiplier value is decreased conversely and it is made for the activity which is easy to perform at the time of lifting of the feeling quantity of state of the feeling to become by weakening the connection with the feeling that it is hard to be determined.

[0035] Therefore, when increasing a feeling multiplier, [for example,] When this activity decision equipment is applied to the pet mold robot of a dog by which "a tail is wagged" and "stability is carried out" were set up as activity, a user by what [time amount / long / a thing / "it strokes"] When the feeling multiplier value of "joy" which receives "a tail being wagged" rises next, it comes to perform "a tail being wagged" for this robot immediately, saying "it strokes". [of activity] [of activity] That is, it becomes possible to lifting of "joy" to return the reaction sensitively by increasing the feeling multiplier of "joy" which receives "a tail is wagged."

[0036] When decreasing a feeling multiplier conversely, moreover, this activity decision equipment as activity -- "throat -- a grounder -- a grounder -- when it applies to the pet mold robot of a cat by which *****" and "***** is turned to" were set up, a user by what [time amount / long / a thing / "it strokes"] "throat of activity -- a grounder -- a grounder -- if a user takes the same action when the feeling multiplier to *****" decreases next -- "throat of activity -- a grounder -- a grounder -- since *****" became

is hard to be determined, it comes to determine "to turn to *****" as activity. That is, a controlled system becomes possible [setting up the condition of "getting used"] by decreasing a feeling multiplier to the specific action which a user repeats.

[0037] In addition, when predetermined conditions are fulfilled, you may make it not only a feeling quantity of state at present but the amount of feeling experiences or feeling variation update a feeling multiplier. Thus, the decision of the activity to change of the feeling of a controlled system is controlled by updating a feeling multiplier under predetermined conditions, and it becomes possible to attach the description to the decision of the activity to change of the feeling of a controlled system.

[0038] According to invention concerning claim 13, it sets to activity decision equipment given in any 1 term of claims 7 and 9. Moreover, said controlled-system activity decision means It is characterized by comparing said amount of feeling experiences determined to said feeling of a specific class with the predetermined threshold set up beforehand, and determining the activity of said controlled system as a specific thing, when this amount of feeling experiences is larger than said threshold.

[0039] For example, when the thing of "rioting" is set up as specific activity when the amount of feeling experiences of the "resentment" exceeds a threshold If the amount of feeling experiences to the feeling of the "resentment" exceeds a threshold when the user took the actuation which induces the "resentment" to a controlled system, a controlled-system activity decision means will disregard the activity which serves as other candidates, and will come to choose "it rioting". [which is specific activity] Thus, by making it make a controlled system perform specific actuation, when each amount of feeling experiences exceeds a threshold for example, when a controlled system is the pet mold robot by which the feeling of "joy" and "dislike" was set up If the amount of feeling experiences of "joy" exceeds a threshold when a user loves If specific actuation of "a dance is danced", "approaching, **ing a tail", etc. is carried out, it is persistently stroked by the disagreeable user and the amount of feeling experiences of "dislike" exceeds a threshold It becomes possible to make it a pet mold robot which does "it escapes" and specific actuation of "turning to *****", and there is interest to which attachment springs [interest] and being easy weariness does not come for a user.

[0040]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained based on a drawing. Drawing 1 thru/or drawing 8 are drawings showing the gestalt of operation of the 1st of the activity decision equipment concerning this invention, and the gestalt of the 2nd operation. Drawing 1 is the block diagram showing the configuration of the activity decision equipment 1 concerning this invention.

[0041] Activity decision equipment 1 Circumference information detection equipment 2 and self-information detection equipment 3, Feeling quantity of state decision equipment 5, controlled-system activity decision equipment 6, and ROM the program for controlling actuation of each equipment was remembered to be although not illustrated, It consists of a central processing unit (CPU) for performing a program, RAM for memorizing the data used by the program, and the I/F section for transmitting data between each equipment. Moreover, two or more kinds of feeling is set to the controlled system.

[0042] Camera 2a to which circumference information detection equipment 2 detects the visual information on a controlled system, From the information detected with microphone 2b which detects surrounding speech information, and camera 2a and

microphone 2b It consists of the description information extract sections 4 which extract the characteristic information to which the feeling change value is set beforehand. To camera 2a by the description information extract section 4 for example, when a person is reflected As for judgment of being a user, and a user's case, distance with the person and its person extract the activity etc. from the information, and when a ball etc. is reflected in others, the color information etc. is extracted. Moreover, the size of sound volume or a user's content of conversation is extracted from the speech information of the circumference detected with microphone 2b. The extracted description information is transmitted to feeling quantity of state decision equipment 5.

[0043] Moreover, pressure-sensitive sensor 3a which detects the load to which the thing in contact with a controlled system gives self-information detection equipment 3 to the contact section, It consists of the description information extract sections 4 which extract characteristic information from the information detected by temperature sensor 3b which detects the temperature of the contactant, and pressure-sensitive sensor 3a and temperature sensor 3b. By the description information extract section 4 The contact information produced by contact of an object, such as "it was struck" and "it having been stroked", is extracted from the magnitude of the load applied to the detected contact section by pressure-sensitive sensor 3a etc. as description information. By moreover, temperature sensor 3b Information with the descriptions, like "it is "hot" and cold" is extracted from the temperature of the detected contactant. The extracted description information is transmitted to feeling quantity of state decision equipment 5.

[0044] Moreover, feeling quantity of state decision equipment 5 consists of feeling quantity of state database 5a which memorized the change value of the feeling quantity of state of each feeling beforehand, and feeling quantity of state decision section 5b which determines the synthetic feeling quantity of state of each feeling from the change value set as each feeling for every description information to the description information extracted. The determined feeling quantity of state is transmitted to controlled-system activity decision equipment 6. Here, the description information selects in advance information with the description which is likely to affect the feeling of a controlled system from information detectable [with circumference information detection equipment 2 and controlled-system self-information detection equipment 3].

[0045] And feeling quantity of state storage 6a which memorizes the synthetic feeling quantity of state of each feeling that controlled-system activity decision equipment 6 was determined by feeling quantity of state decision equipment 5, It consists of activity decision section 6b which determines the activity which a controlled system is made to perform. Feeling quantity of state storage 6a All the feeling quantity of states determined as the predetermined period are memorized. Feeling quantity of state decision section 6b It is based on the feeling quantity of state at present determined by the past feeling quantity of state and feeling quantity of state decision section 5b which are memorized by feeling quantity of state storage 6a. The amount of feeling experiences, Feeling variation is computed, activity consideration reinforcement is computed from the feeling multiplier determined for every these calculation result and activity beforehand set as the controlled system, and the activity which a controlled system is made to perform based on this activity consideration reinforcement is determined. The determined activity is transmitted to the activity activation section.

[0046] The amount of feeling experiences reads the feeling quantity of state determined

as the past predetermined period from feeling quantity of state storage 6a here. The feeling quantity of state of the same feeling is determined by starting by operations, such as ****. Feeling variation In this configuration, since the feeling quantity of state is dealt with as discrete data, the feeling quantity of state determined as the predetermined past is read from feeling quantity of state storage 6a, and it determines by taking the difference of this and the feeling quantity of state at present determined by feeling quantity of state decision section 5b. Furthermore, activity consideration reinforcement asks for a feeling quantity of state, the amount of feeling experiences and feeling variation, and the feeling multiplier set up for every activity by starting by operations, such as addition and ****. And the decision of activity sets up conditions according to the property of a controlled system, and determines that the magnitude of the activity consideration reinforcement of each activity is compared, and it is decided that it will be the activity of the largest numeric value etc. according to the condition.

[0047] Drawing 2 - drawing 4 are flow charts which show an example of the processing of operation in each above-mentioned equipment. Hereafter, processing of each equipment of operation is explained based on drawing 2 - drawing 4. Drawing 2 is a flow chart which shows processing of the main program which controls processing of the whole activity decision equipment 1 of operation. First, as shown in drawing 2, while it shifts to step S200 and camera 2a and microphone 2b detect circumference information, by pressure-sensitive sensor 3a and temperature sensor 3b, self-information is detected, a detection result is transmitted to the description information extract section 4, and it shifts to step S202.

[0048] If it shifts to step S202, by the description information extract section 4, the description information will be extracted from the detected circumference information and self-information, and it will transmit to feeling quantity of state decision equipment 5, and will shift to step S204. If it shifts to step S204, by performing the subprogram S1 which performs processing which computes the feeling quantity of state of each feeling, a feeling quantity of state will be determined, the result will be acquired, and it will shift to step S206.

[0049] If it shifts to step S206, the determined feeling quantity of state will be shifted to writing and step S208 at feeling quantity of state storage 6a. At step S208, by performing the subprogram S2 which performs processing which determines the activity which a controlled system is made to perform, activity is determined, the result is acquired and it shifts to step S210.

[0050] If it shifts to step S210, the determined activity will be transmitted to the activity activation section, and it will shift to step S200. Therefore, in the above-mentioned main program, activity is determined as real time by carrying out by repeating processing of step S200 - step S210 for every predetermined period.

[0051] Drawing 3 is a flow chart which shows processing of a subprogram S1. Hereafter, a flow of operation is explained based on drawing 3. With the gestalt of this operation, feeling of a controlled system is made into two kinds, a and b, and the description information acquired is set to X, Y, and Z. First, it shifts to step S300, and from feeling quantity of state database 5a, the change value of the feeling quantity of state of each feeling beforehand set up to the description information extracted by the description information extract section 4 is read, and it shifts to step S302. Here, the change value of a feeling quantity of state is carried out [having set up as taX, taY, taZ, tbX, tbY, and tbZ

and] to X, Y, Z, and Feeling a and b of the description information, respectively.

[0052] processing will be ended if the feeling quantity of state which determined the synthetic feeling quantity of state according to the formula (1) shown below and (2), respectively, and was determined is returned to a main program from the change value of the feeling quantity of state of the feeling a and b which carried out reading appearance when it shifted to step S302.

$$Pa=taX+taY+taZ \dots\dots\dots (1)$$

$$Pb=tbX+tbY+tbZ \dots\dots\dots (2)$$

However, the synthetic feeling quantity of state to Feeling a and b is set to Pa and Pb, respectively. Therefore, the feeling quantity of state Pa to Feeling a is computed by taking total of taX-taZ, and the feeling quantity of state Pb to Feeling b is similarly computed by taking total of tbX-tbZ.

[0053] Although the above-mentioned formula (1) and (2) calculate by performing a subprogram S1 here, this formula is a formula when two kinds, a and b, are set up as feeling and three, X, Y, and Z, are set up as description information, and can set up actual more much feeling and the description information. In that case, the above-mentioned formula of number of feeling will increase, and **** for the description information number will be performed for every formula.

[0054] Drawing 4 is a flow chart which shows processing of a subprogram S2. Hereafter, a flow of operation is explained based on drawing 4 . Here, suppose that alpha, beta, and gamma are set up as activity which a controlled system can perform. First, it shifts to step S400, and all the feeling quantity of states determined as the predetermined past are read from feeling quantity of state storage 6a, and it shifts to step S402. Here, since it is in the condition that only the feeling quantity of state at present is computed when it comes to this step for the first time, predetermined initial value will be called. Here, it supposes that two feeling quantity of states of the before [one] of the feeling quantity of state determined before two are read, respectively to Feeling a and b, and a feeling quantity of state is set to Pb1, Pb2, and Pb3 from an old thing to Pa1, Pa2, Pa3, and Feeling b at order to Feeling a, respectively.

[0055] If it shifts to step S402, according to the formula (3) shown from the feeling quantity of states Pa3 and Pb3 at present determined by feeling quantity of state decision section 5b, the feeling quantity of states Pa1 and Pa2 by which reading appearance was carried out, and Pb1 and Pb2 below, and (4), the amount of feeling experiences of Feeling a and b will be computed, respectively, and it will shift to step S404.

$$Ia=Pa1+Pa2+Pa3 \dots\dots\dots (3)$$

$$Ib=Pb1+Pb2+Pb3 \dots\dots\dots (4)$$

However, the amount of feeling experiences to Feeling a and b is set to Ia and Ib, respectively. Therefore, the amount Ia of feeling experiences to Feeling a is computed by taking total of Pa1-Pa3, and the amount Ib of feeling experiences to Feeling b is similarly computed by taking total of Pb1-Pb3.

[0056] If it shifts to step S404, feeling variation will be computed according to the formula (5) which calculates the feeling variation shown below from the feeling quantity of state determined as the past read from feeling quantity of state storage 6a, and the feeling quantity of state at present determined by feeling quantity of state decision section 5b, and (6), and it will shift to step S406.

$$Da=Pa3-Pa2 \dots\dots\dots (5)$$

Db=Pb3-Pb2 (6)

However, feeling variation is set to Da and Db to Feeling a and b, respectively.

[0057] In addition, when it comes to this step for the first time, the value of the predetermined past turns into initial value. Therefore, the feeling variation Da to Feeling a computes the difference of the feeling quantity of state Pa 2 and the feeling quantity of state Pa of ***** 3 which were determined before one, and the feeling variation Db to Feeling b is similarly determined by computing the difference of Pb2 and Pb3. a step -- S -- 406 -- shifting -- if -- this time -- feeling -- a quantity of state -- having computed -- feeling -- an experience -- an amount -- and -- feeling -- variation -- feeling -- a multiplier -- from -- the following -- being shown -- a formula -- (-- seven --) - (-- nine --) -- following -- activity consideration reinforcement -- computing -- step S408 -- shifting . The feeling multiplier to Activity alpha, beta, and gamma and the feeling quantity of states Pa and Pb at present here It is referred to as kPaalpha, kPabeta, kPagamma, kPbalpha, kPbbeta, and kPbgamma, respectively. The feeling multiplier to the amounts Ia and Ib of feeling experiences, respectively Moreover, kIaalpha, It is referred to as kIabeta, kIagamma, kIbalpha, kIbbeta, and kIbgamma, and further, if the feeling multiplier to the feeling variation Da and Db is set to kDaalpha, kDabeta, kDagamma, kDbalpha, kDbbeta, and kDbgamma, respectively, activity consideration reinforcement will be called for by the following formulas.

[0058]

Malpha=(kPa alpha*Pa) +(kIa alpha*Ia) +(kDa alpha*Da) +(kPb alpha*Pb) +(kIb alpha*Ib)+ (kDb alpha*Db) (7)

Mbeta=(kPa beta*Pa) +(kIa beta*Ia) +(kDa beta*Da) +(kPb beta*Pb) +(kIb beta*Ib)+ (kDb beta*Db) (8)

Mgamma=(kPa gamma*Pa) +(kIa gamma*Ia) +(kDa gamma*Da) +(kPb gamma*Pb) +(kIb gamma*Ib)+ (kDb gamma*Db) (9)

That is, as shown in above-mentioned formula (7) - (9), for every activity which this controlled system beforehand set as the controlled system is made to perform, activity consideration reinforcement integrates each of the feeling quantity of states Pa and Pb, the amounts Ia and Ib of feeling experiences, and the feeling variation Da and Db, and the above-mentioned feeling multiplier, and computes them further by carrying out the guide peg of the whole of the integrated value.

[0059] Moreover, a feeling multiplier is for connecting each feeling and activity, is integrating this numeric value, respectively with the feeling quantity of states Pa and Pb, the amounts Ia and Ib of feeling experiences, and the feeling variation Da and Db, and computes first the connection with these values and the activity beforehand set as the controlled system, respectively. Here, although a feeling quantity of state, the amount of feeling experiences, and especially feeling variation can compute activity consideration reinforcement independently to each even if they do not combine, they compute the activity consideration reinforcement which collected to one the property which each of a feeling quantity of state, the amount of feeling experiences, and feeling variation has by combining these all with the gestalt of this operation.

[0060] If it shifts to step S408, the activity consideration reinforcement computed for every activity will be measured according to the predetermined conditions set up beforehand, and it will shift to step S410. That is, predetermined conditions are determining conditions for determining the activity which a controlled system is made to

perform from the computed activity consideration reinforcement of determining to the consideration reinforcement which was beforehand set as the controlled system and which was computed for every activity as activity which numerical magnitude is compared [activity] and makes a controlled system performing activity of a thing with the biggest value etc.

[0061] All processings will be ended if the activity which determined the activity with which activity consideration reinforcement agreed on predetermined conditions as activity which a controlled system is made to perform, and determined it when it shifted to step S410 is returned to a main program. In addition, formula (3) - (9) is added to the conditions applied to a formula (1) and (2). Since it becomes a formula at the time of setting up three, alpha, beta, and gamma, as activity which a controlled system is made to perform, and setting up the above-mentioned feeling multiplier to such each activity and Feeling a and b, in practice The number of number [the increase of the arity of a formula and] of activity set up of formulas will increase only the number of the feeling set as the controlled system.

[0062] Next, actual actuation of the activity decision equipment 1 in the gestalt of this operation is explained. In addition, on the occasion of explanation, the case where activity decision equipment 1 is applied to a pet mold robot will be dealt with. first, it being made to correspond to a of the above-mentioned feeling, and b as a pet mold robot's feeling, and two kinds, "joy" and "sadness", being set up, respectively, and "people being seen" as description information -- "-- stroking -- " -- "-- striking -- " -- seven "it is loud being the "sound", "gesture could be seen", hot ["hot"], and cold" are set up. And it is made to correspond to Above alpha, beta, and gamma as activity, and three, "it apes", are set up, respectively. ["he is "glad" and absent-minded" and] Furthermore, as a change value of a feeling quantity of state, the response of the content and change value was made into the table for feeling quantity of state database 5a which set up the change value for every class of each feeling as drawing 5 . However, the set-up change value of the numeric value used actually is unrelated.

[0063] First, with circumference information detection equipment 2 and self-information detection equipment 3, circumference information and self-information are detected and such information is transmitted to the description information extract section 4 (step S200). And if it shifts to step S202, what agrees with the description information set up beforehand will be extracted from these detection information. Here, suppose that the figure of those who are present in the direction of a long distance at camera 2a was reflected as circumference information. Moreover, nothing is especially detected by microphone 2b and pressure-sensitive sensor 3a, but suppose at temperature sensor 3b that the temperature set up as ordinary temperature (for example, 20 degrees) was detected. Therefore, "people are seen" is extracted from the detected information by the description information extract section 4 as description information.

[0064] If it shifts to step S204, a main program will perform a subprogram S1 and will shift to step S300. At step S300, the change value of the feeling quantity of state set up by receiving "people are seen" is read from feeling quantity of state database 5a. Therefore, "15" is carried out for the front twist of drawing 5 , and "joy", and reading appearance of the change value is carried out for "sadness" to "-30." performing this step, if it shifts to step S302 -- for the first time -- ** -- since it becomes, and the extracted description information is "people are seen" when the whole of each feeling becomes initial value

(the gestalt of this operation 0) and a synthetic feeling quantity of state is computed according to a formula (1), that change value serves as a feeling quantity of state as it is. That is, to "joy and sadness" of feeling, a current synthetic feeling quantity of state is determined as "15, 0", returns this value to a main program, and ends processing.

However, suppose that the feeling quantity of state of each feeling is not become a numeric value below "0" with the gestalt of this operation.

[0065] At step S206, the determined feeling quantity of state is memorized to feeling quantity of state storage 6a, and it shifts to step S208. At step S208, a subprogram S2 is performed, it shifts to step S400, and two feeling quantity of states determined as the past are read from feeling quantity of state storage 6a in step S400. however, performing this step -- for the first time -- ** -- since it becomes, it becomes initial value (the gestalt of this operation 0) except [all] a current feeling quantity of state. That is, all of the feeling quantity of state "Pa1, Pa2" in above-mentioned formula (3) - (6), and "Pb1, Pb2" are set to "0" whose a value is initial value.

[0066] Since all the past feeling quantity of states will be set to "0" although the amount of feeling experiences is computed according to a formula (3) and (4) from "15, 0" to "joy and sadness" of a current feeling quantity of state, and the past feeling quantity of state (all 0) if it shifts to step S402, "0" will be added to a current feeling quantity of state in this case. therefore, a current feeling quantity of state -- as it is -- the amount of feeling experiences -- becoming -- feeling -- "-- it is glad and the amount of feeling experiences to sadness" "Ia, Ib" is set to "15, 0."

[0067] And if it shifts to step S404, at this step, feeling variation will be computed for the predetermined past as the past in front of one according to a formula (5) and (6) from the feeling quantity of state in front of one (all 0), and a current feeling quantity of state. Also in this case, it becomes the same value as a current feeling quantity of state like the amount of feeling experiences. namely, feeling -- "-- it is glad and the feeling variation "Da, Db" to sadness" is set to "15, 0."

[0068] If it shifts to step S406, the activity consideration reinforcement to all the activity that a pet mold robot performs will be computed according to formula (7) - (9) from a feeling quantity of state, the amount of feeling experiences, current feeling variation, and a current feeling multiplier. therefore, activity consideration on-the-strength Malpha which receives "it being glad" -- formula (7) $Malpha = (kPaalpha * 15) + (kIalpha * 15) + (kDaalpha * 15) + (kPbalpha * 0) + (kIbalpha * 0) + (kDbalpha * 0) = 15 * (kPaalpha + kIalpha + kDaalpha) \dots\dots\dots (10)$ [of activity]

a next door, activity consideration on-the-strength Mbeta which receives activity "is

absent-minded" and "it aping" similarly, and M gamma -- respectively -- a formula (8)

and formula (9) $Mbeta = 15 * (kPabeta + kIabeta + kDabeta) \dots\dots\dots (11)$

$Mgamma = 15 * (kPagamma + kIagamma + kDagamma) \dots\dots\dots (12)$

It becomes.

[0069] In this case, since it is in the condition which "people are seen" is only extracted as description information, and does not have the past data, all of a feeling quantity of state, the amount of feeling experiences, and feeling variation are the same numeric values. Here, based on drawing 7 which is the table showing an example of a feeling multiplier, activity consideration reinforcement is computed actually and the activity which a pet mold robot is made to perform actually is determined based on the flow chart of drawing 6 which shows an example of the determining condition of activity.

[0070] The front twist of drawing 7, and the feeling multiplier which receives "it being glad" [of activity] As opposed to each of a feeling quantity of state "kPaalpha, kPabeta, kPagamma", the amount of feeling experiences "kIaalpha, kIabeta, kIagamma", and feeling variation "kDaalpha, kDabeta, kDagamma" Since it is set up with "15, 0, 10", "6, 0, 4", and "5, 0, 5", these numeric values are substituted for the above-mentioned formula (10), and it will be set to "390" if it asks for activity consideration on-the-strength Malpha which receives "it being glad". [of activity] Similarly, the activity consideration reinforcement of M gamma to which activity consideration on-the-strength Mbeta which receives activity "is absent-minded" receives "it aping" from "0" and a formula (12) is computed with "285" from a formula (11), respectively. [of activity]

[0071] If processing is performed from these numeric values according to the flow chart of drawing 6 which shows the determining condition of activity, first, it shifts to step S600, and it is "390", and since the maximum activity consideration reinforcement is not less than 200, it will shift to (No) and step S602. If it shifts to step S602, since the activity consideration reinforcement of mimicry will be "285" and will become less than 550 (Yes), it shifts to step S608.

[0072] If it shifts to step S608, activity consideration reinforcement will be determined as activity which makes a pet mold robot perform "it being glad", and will end processing. [of the activity which is max] And the information on the determined activity is transmitted to the activity activation section, for example, when a pet mold robot is a dog, it performs actuation "with which it is pleased" of "***ing a tail."

[0073] Here, the activity determining condition of drawing 6 is called and performed by the subprogram S2 as a subprogram S3. Furthermore, a pet mold robot's circumference information and self-information are detected at step S200 like the above, and the case where two, "gesture could be seen", are extracted as description information at step S202 is explained. ["people being seen" and] In this case, as for "it being glad and "man being seen to sadness"", "+15, -30" receive "gesture could be seen" from drawing 5, and "+200, -500", and a value are read from feeling quantity of state database 5a (step S300). [of feeling] Therefore, a main program performs a subprogram S1 and computes "0" as a feeling quantity of state Pb of "215" and "sadness" as a feeling quantity of state Pa of "joy" according to a formula (1) and (2), respectively. In the gestalt of this operation here, since Pa at present and Pb serve as newest feeling quantity of state as memorizing three feeling quantity of states until feeling quantity of state storage 6a results from the past in front of two now for every feeling, feeling quantity of state storage 6a will memorize as Pa3 and Pb3 (step S302).

[0074] The amount Pa of feeling experiences of "joy" the feeling quantity of state computed before one as Pa2 and Pb2, respectively and the feeling quantity of states Pa1 and Pb1 in front of "15", "0", and two Since it is set to "0" which is both initial value, a main program A subprogram S2 is performed, these values are read, according to a formula (3) and (4), "230" is computed as an amount Ia of feeling experiences of "joy", and "0" is computed as an amount Ib of feeling experiences of "sadness", respectively (steps S400-S402). Furthermore, from "15" which is the feeling quantity of states Pa2 and Pb2 in front of one, and "0", according to a formula (5) and (6), "200" is computed as feeling variation Da of "joy", and "0" is computed as an amount Db of feeling experiences of "sadness", respectively (step S404). Therefore, if it receives "he is glad [of activity / "glad"], and absent-minded", and "it aping" and activity consideration

reinforcement is computed according to formula (7) - (9) from the feeling multiplier shown in the above-mentioned feeling quantity of state, the amount of feeling experiences, feeling variation, and drawing 7, "5375", "0", and "4070" will be computed, respectively (step S406).

[0075] Based on these numeric values, a main program performs a subprogram S3 and it shifts to step S600 first, and it is "5375", and since the maximum activity consideration reinforcement is not less than 200, it shifts to (No) and step S602. If it shifts to step S602, the activity consideration reinforcement of mimicry is "4070", and since it becomes 550 or more, it will shift to (No) and step S604.

[0076] If it shifts to step S604, it will determine as activity which makes a pet mold robot perform "it apes", and processing will be ended (step S408 - step S410). And the information on the determined activity will be transmitted to the activity activation section, and a pet mold robot will ape the "gesture" which the person reflected in camera 2a performed in this case.

[0077] moreover -- "-- a favorite person -- near -- it is -- " -- and, when "struck by the man" If the change value of a feeling quantity of state whose change value of the feeling quantity of state of "joy" and "sadness" denies and suits is set up, respectively so that a synthetic feeling quantity of state may become a value near "0" Since activity consideration reinforcement serves as a small value as a result and the maximum activity consideration reinforcement in the flow chart of drawing 6 which is the setups at the time of activity decision becomes easy to become less than 200, "he is absent-minded" becomes it is easy to be chosen as activity. [it]

[0078] And if a feeling quantity of state is accumulated in feeling quantity of state storage 6a, the amount of feeling experiences will participate in the decision of activity consideration reinforcement greatly. For example, when the amount of feeling experiences of "joy" is a big value, supposing a big change arises in the feeling quantity of state of "sadness" at present, the condition of "joy" of a just before will affect the calculation result of the activity consideration reinforcement by formula (7) - (9) with the amount of feeling experiences of a big numeric value. Numerically, even if the feeling quantity of state of "joy" is [the feeling quantity of state of "sadness"] "50" in "0" in this time, the feeling quantity of states Pa1 and Pa2 of "joy" before two are "70" and "50" from this time, respectively. When the feeling quantity of states Pb1 and Pb2 of "sadness" are "0" and "0", respectively Since the amount of feeling experiences of "joy" is set to "120" and the amount of feeling experiences of "sadness" is set to "50" Among the feeling multipliers set up for every activity, to the thing to the amount of feeling experiences of each feeling which has a big feeling multiplier, in order to take the integrated value, it will have big effect on the numeric value of activity consideration reinforcement.

[0079] Furthermore, when it was a big value and the threshold which the effect which it has on activity consideration reinforcement becomes large, for example, has this value is exceeded like [feeling variation] the amount of feeling experiences So that special activity may be determined set up conditions or Or by the feeling variation of specific feeling being less than a certain value, and the feeling quantity of state of other feeling being conspicuous, when it is not a big value The device of making a pet mold robot perform actuation to which the action is urged etc. is also possible so that a user may perform action to which the specific feeling quantity of state rises. In a dog type pet mold

robot the feeling of "joy" for example, this feeling variation with a small value as specific feeling. And when there is nothing of a conspicuous value to which the feeling quantity of state of other feeling influences the decision of activity. A pet mold robot is made to do actuation which he wants to carry out action a user, such as approaching a user with a swing in a tail, raises [action] the feeling quantity of state of "joy" of "it strokes" etc. involuntarily, and becomes.

[0080] Next, an example of the gestalt of the operation which has the function which updates a feeling multiplier as a gestalt of operation of the 2nd of this invention in addition to the gestalt of implementation of the above 1st is explained based on the flow chart which shows an update process of the feeling multiplier of drawing 8. In addition, the part which overlaps the gestalt of implementation of the above 1st omits explanation, and explains only an update process of a feeling multiplier. First, the case where this invention is applied to the pet mold robot of a dog by which "a tail is wagged" and "stability is carried out" were set up as activity, and "joy" and "sadness" were set up as feeling is explained. Here, when the feeling quantity of state of this feeling exceeds a threshold by making "joy" of feeling into specific feeling as updating conditions for a feeling multiplier, the increment in the specified quantity of the multiplier value over the feeling of "joy" of the feeling multiplier set up to this activity will be carried out by making "to wag a tail" into specific activity. [of activity]

[0081] If renewal of a feeling multiplier is performed for every predetermined period and it becomes the period, as shown in drawing 8, it will shift to step S800 first. And the feeling quantity of state of "joy" at present determined by feeling quantity of state decision section 5b is compared with the set-up threshold, when it judges and is over whether the feeling quantity of state of "joy" is over the threshold (Yes), it shifts to step S802, and when having not exceeded, (No) ends processing and is returned to the original processing.

[0082] When it shifts to step S802, and the increment in the specified quantity of the multiplier value over the feeling of "joy" of the feeling multiplier set up for "wagging a tail" is carried out and a feeling multiplier is updated, a series of processings are ended and it is made to return to the original processing. Therefore, if the condition that the feeling quantity of state of "joy" exceeds a threshold continues for a long time, it will come to opt for the actuation the activity consideration reinforcement computed by receiving "a tail is wagged" serves as a gradually big value, and it "wags a tail" even if the value is not so big. [as opposed to / henceforth / the feeling quantity of state of "joy"]

[0083] furthermore -- as activity -- "throat -- a grounder -- a grounder -- the case where it applies to the pet mold robot of a cat by which *****" and "***** is turned to" were set up, and "joy" and "sadness" were set up as feeling is explained. the time of the feeling quantity of state of this feeling exceeding a threshold by making "joy" of feeling into specific feeling like the pet mold robot of the above-mentioned dog as updating conditions for a feeling multiplier here -- "throat of activity -- a grounder -- a grounder -- specified-quantity reduction of the multiplier value over the feeling of "joy" will be carried out by making *****" into specific activity. [the feeling multiplier set up to this activity]

[0084] First, if a predetermined period comes, the feeling quantity of state of "joy" determined by feeling quantity of state decision section 5b is measured with a

predetermined threshold. the case where it is over the threshold -- step S802 -- shifting -- "throat -- a grounder -- a grounder -- specified quantity reduction of the multiplier value over the feeling of "joy" of the feeling multiplier set up to *****" is carried out, a series of processings are ended, and it is made to return to the original processing

[0085] As opposed to ***** if the condition that the feeling quantity of state of "joy" [therefore,]" exceeds a threshold continues for a long time -- "throat -- a grounder -- a grounder -- activity consideration reinforcement It becomes a gradually small value. The feeling quantity of state of "joy" and "sadness" both at for example, the same time of a value "throat -- a grounder -- a grounder -- if the multiplier value of "joy" of *****" is a small value, since activity consideration reinforcement will serve as a small value, the probability which is another activity for "turning to *****" to be determined becomes high.

[0086] The activity decision equipment 1 concerning this invention as mentioned above, with circumference information detection equipment 2 The visual information and speech information of a controlled system are detected. With moreover, self-information detection equipment 3 The contact information on an object over a controlled system is detected. By and the description information extract section 4 Since it becomes possible to set up the change value of the quantity of state of the feeling set as the controlled system by extracting the description information to the description information on the ability "for gesture to have been able to be seen", ["people are seen",] It is possible to set up the condition of deep feeling that the circumference information and self-information of a controlled system were reflected, by setting up much description information to which feeling is changed.

[0087] Moreover, while expressing each condition of all the feeling of a controlled system for three numeric values, a feeling quantity of state, the amount of feeling experiences, and feeling variation The feeling multiplier which connects the activity which sets up the change value so that the direction of strong feeling may serve as a big numeric value from weak feeling according to the strength of the feeling in the condition of the feeling at that time, and is beforehand set as the controlled system, and each feeling, Since the activity which computes activity consideration reinforcement and a controlled system is made to perform by the calculation result from a feeling quantity of state, the amount of feeling experiences, and feeling variation is determined The activity in which the information on the variation from the condition of feeling at present, the condition of feeling until it results [from the past] in current, and the predetermined past of a feeling quantity of state to current was reflected will be determined as activity which a controlled system is made to perform, and the decision of the suitable activity to a complicated feeling condition is attained.

[0088] Moreover, since predetermined conditions are set up at the time of the decision of activity, the thing of a numeric value for example, with the largest activity consideration reinforcement is opted for setting out of this condition as activity, and, in addition to this condition, a predetermined threshold is established like drawing 6 , the comparison with the activity consideration reinforcement to specific activity and its threshold is also performed, and it becomes possible to determine activity etc. Moreover, a user's interest is lengthened and setting out of conditions with which it is not made to get bored of specific activity being determined or setting up the activity suddenly generated in the probability for it to be low when the numeric value is in a high condition to specific

activity or feeling, if specific conditions with difficult your making it materialized are satisfied with devising setting out of conditions, for example etc. is attained.

[0089] Moreover, since he is trying to update the feeling multiplier to specific activity when the feeling quantity of state of specific feeling is over the predetermined threshold, when updating with the inclination which increases a feeling multiplier By specific activity becoming is easy to be determined to specific feeling, and decreasing a feeling multiplier Since it is made for specific actuation to become being hard to opt to the action which raises the specific feeling which a user repeats, the increment in a feeling multiplier is received. Characterization by the controlled system will be performed and the "habituation" to the repeat of the same stimulus of a controlled system will be set up to reduction of a feeling multiplier. Therefore, the decision of the activity to change of the feeling of a controlled system is controlled by updating a feeling multiplier under predetermined conditions, and it becomes possible to attach the description to the decision of the activity to change of feeling.

[0090] Here, circumference information detection equipment 2 and self-information detection equipment 3 correspond to a controlled-system circumference information detection means according to claim 1 and a controlled-system self-information detection means, respectively, and process step S200 of drawing 2 . Moreover, the feeling quantity of state decision section 5 corresponds to claim 1 and a feeling quantity of state decision means according to claim 2, and processes the subprogram S1 (step S300 - step S302) of drawing 3 . And activity decision equipment 6 corresponds to claim 1 and a controlled-system activity decision means according to claim 3 to 13, and processes an update process (step S800 - step S802) of drawing 4 , drawing 6 and the subprogram S2 (step S400 - step S410) of drawing 8, a subprogram S3 (step S600 - step S608), and a feeling multiplier.

[0091] In addition, although a feeling quantity of state, the amount of feeling experiences, and feeling variation are computed and activity consideration reinforcement is computed using the all, activity consideration reinforcement may be computed using two combination, not only this but arbitration, and you may make it compute in the gestalt of the above-mentioned implementation only using any one. In this case, although the properties reflected in activity by each combination differ, when you want to simplify control, or when not accomplishing semantics [that numeric value], it is removing from combination, and is also that the cost is cut down by suppressing a useless operation and changing to low price CPU.

[0092] Moreover, in the gestalt of the above-mentioned implementation, although above-mentioned formula (1) - (12) was used for calculation of a feeling quantity of state, the amount of feeling experiences, feeling variation, and activity consideration reinforcement, what kind of formula may be used in the range which does not deviate from the main point of not only this but this invention. Moreover, although the activity determining condition of drawing 6 has determined the actuation which a controlled system is made to perform with the gestalt of the above-mentioned implementation, what kind of conditions may be set up in the range which does not deviate from the main point of not only this but this invention.

[0093] Moreover, in the gestalt of the above-mentioned implementation, although the feeling set as the controlled system was only two, "joy" and "sadness", not only in addition to this but such feeling, the "resentment", "fear", "surprise", "dislike", etc. may

set up other feeling. Moreover, in the gestalt of the above-mentioned implementation, although he is trying to memorize three feeling quantity of states until it results [from the past in front of two] in current to each feeling, a feeling quantity of state until only the part of the storage capacity of not only this but storage results [from the past] in current is memorized, all they may be used for an operation or only the range of desired may be used for an operation.

[0094] moreover, as color information is detected, in case a controlled system performs activity on the basis of the object of a user, a ball, etc. as circumference information in the gestalt of the above-mentioned implementation You may make it carrying out actuation "which bends backward" in consideration of the color information on an object, if an object is a disagreeable color, or carrying out actuation "skipped and attached", if an object is a favorite color etc. also take color information into consideration to the decision of activity.

[0095] Moreover, the feeling magnitude of attenuation is set up and you may make it each feeling decline in the gestalt of the above-mentioned implementation based on the set-up numeric value with the passage of time. In this case, since setting out of the feeling which cannot fall easily once a numeric value goes up etc. is attained, setting out in the feeling condition of changing to real time is attained. Moreover, it also becomes possible to, carry out characterization characteristic of a pet mold robot etc. by changing this set point for every controlled system for example.

[0096] Moreover, in the gestalt of the above-mentioned implementation, a feeling multiplier may be updated, when you may make it update when not only a feeling quantity of state at present but the amount of feeling experiences or feeling variation fulfills predetermined conditions, and the sum of the combination of arbitration is over the predetermined threshold among a feeling quantity of state at present, the amount of feeling experiences, and feeling variation. Moreover, in the gestalt of the above-mentioned implementation, although renewal of a feeling multiplier is performed only to change of the feeling quantity of state of specific feeling Not only this but when the light-and-darkness information on surrounding, atmospheric temperature information, etc. are detected as circumference information, and predetermined conditions are established to these, for example, darkness continues for a long time When the feeling multiplier to "fear" etc. is decreased, and you may make it update the feeling multiplier to the feeling relevant to detection information and detection of a "hungry" condition is carried out only as circumference information, for example, self-information, although reaction actuation of ["be / it / hungry"] is returned, usually When this condition continues for a long time, predetermined conditions are established and you may make it update a feeling multiplier also to self-information, such as decreasing the feeling multiplier to this reaction actuation, and making it this reaction actuation become is hard to perform etc.

[0097]

[Effect of the Invention] By according to the activity decision equipment according to claim 1 concerning this invention, determining a feeling quantity of state to the feeling set as the controlled system, and using the whole of this feeling quantity of state from the circumference information and self-information of a controlled system, as explained above Since the activity which a controlled system is made to perform is determined and the decision of the activity to complex feeling is attained, when the feeling of "joy" and "sadness" occurs simultaneously, it becomes possible to make a controlled system

perform actuation of the content "he is absent-minded."

[0098] Moreover, the activity decision equipment according to claim 2 concerning this invention Since it determines that a feeling quantity of state will become a bigger numeric value than the time when the direction when strong is weak according to the strength of feeling in addition to said effectiveness of claim 1 When the same actuation is taken by the favorite user and the ordinary user, the direction of a favorite user's action by lifting of the quantity of state of feeling becomes possible [attaining both differentiation] by making it go up more greatly than an ordinary user.

[0099] Moreover, according to the activity decision equipment according to claim 3 to 5 concerning this invention In addition to said effectiveness according to claim 1 or 2, the amount of feeling experiences and feeling variation are determined. The actuation in which the flow of the feeling in consideration of the past feeling quantity of state is given in addition to the actuation to the complex feeling according to the feeling quantity of state at that time, and the reflecting actuation to change of intense feeling, Or since it becomes possible to make a controlled system perform actuation which a user is made to sense positiveness and is sold to him, it is possible to determine the activity which has a touch of reality reflecting the condition of feeling, for example to the controlled system of a pet mold robot, a still more advanced humanoid robot, etc.

[0100] Moreover, according to the activity decision equipment according to claim 6 to 9 concerning this invention As opposed to the activity of the controlled system which is set up beforehand in addition to said effectiveness according to claim 1 to 5 A feeling multiplier is set up. Either this multiplier, a feeling quantity of state and the amount of feeling experiences and feeling variation. Or since activity consideration reinforcement was determined for every activity, and this activity consideration reinforcement has determined activity from all, and it becomes possible to strengthen the connection with activity and each feeling, the decision of the suitable activity to a complicated change of feeling is attained.

[0101] Moreover, according to the activity decision equipment according to claim 10 concerning this invention Since total time amount while this quantity of state is over the predetermined threshold among the feeling quantity of states determined by the time it resulted [from the past] in either of claims 3, 5, 7, and 9 current in addition to said effectiveness of a publication is made into the amount of feeling experiences When the feeling quantity of state of the magnitude beyond a threshold continues and is determined in the past, the amount of feeling experiences serves as a big value, and influences also in the decision of activity consideration reinforcement strongly. Therefore, it becomes possible to determine the activity by which the condition of the past feeling was reflected in the controlled system by setting a threshold as a suitable value and adjusting activity consideration reinforcement etc.

[0102] Moreover, according to the activity decision equipment according to claim 11 concerning this invention Difference with predetermined values, such as a feeling quantity of state determined by the time it resulted [from the predetermined past] in either of claims 3, 5, 7, and 9 current in addition to said effectiveness of a publication, initial value of each feeling, or the average, is computed. Since the amount of feeling experiences is determined by accumulating this difference, when the thing beyond the average has many feeling quantity of states of each feeling, the amount of feeling experiences serves as a big value, and affects the decision of activity consideration

reinforcement etc. That is, even if the feeling of "joy" will be in a strong condition suddenly after the strong condition of the feeling of "sadness" continues for a long time for example, since the element of the feeling that many feeling quantity of states big in the past were determined to activity consideration reinforcement etc. is reflected strongly, it becomes possible for unsuitable activity, such as "dancing", to be made not to be determined with the amount of feeling experiences of sadness.

[0103] Moreover, according to the activity decision equipment according to claim 12 concerning this invention When the feeling quantity of state to specific feeling has satisfied the predetermined conditions set up beforehand in addition to said effectiveness according to claim 6 to 9 Since only the specified quantity can increase or decrease the value of the feeling over this feeling quantity of state among the feeling multipliers set as each activity and the connection with feeling and activity can be controlled It becomes possible to attach the description to the decision of the activity to change of the feeling of a controlled system.

[0104] Moreover, according to the activity decision equipment according to claim 13 concerning this invention When a user takes the actuation which induces specific feeling to a controlled system in addition to said effectiveness according to claim 7 or 9 When the amount of feeling experiences to the feeling exceeds a threshold, a controlled-system activity decision means Since the activity which serves as other candidates is disregarded and it comes to choose specific activity, when a controlled system is the pet mold robot by which the feeling of "joy" and "dislike" was set up, for example If the amount of feeling experiences of "joy" exceeds a threshold when a user loves If specific actuation of "a dance is danced", "turning round and round, **ing a tail", etc. is carried out, it is persistently stroked by the disagreeable user and the amount of feeling experiences of "dislike" exceeds a threshold There is interest to which it becomes possible to make it a pet mold robot which does "it escapes" and specific actuation of "turning to *****", and attachment springs [interest] and being easy weariness does not come for a user.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the activity decision equipment which determines the activity which the controlled system which has two or more kinds of feeling performs based on the condition of feeling.

[0002]

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PRIOR ART

[Description of the Prior Art] Conventionally, for example, when a controlled system is the pet mold robot which has three feeling, "sadness", "joy", and the "resentment" The condition of the circumference which surround pet mold robots, such as brightness, silence, etc. around actuation and around [a user's expression or], is detected. And the condition at the time of being touched by the user ("struck") and a pet mold robot's own conditions, such as a hungry condition (residue of a cell), were detected, and the condition was numerically determined for every class of feeling based on these detection results. ["it was stroked",] And although it was conspicuous, its attention was paid for seeing, and the activity which a pet mold robot is made to perform by choosing the activity relevant to the feeling which is the numerical description among each feeling from the candidates who have set up beforehand was determined.

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EFFECT OF THE INVENTION

[Effect of the Invention] By according to the activity decision equipment according to claim 1 concerning this invention, determining a feeling quantity of state to the feeling set as the controlled system, and using the whole of this feeling quantity of state from the circumference information and self-information of a controlled system, as explained

above Since the activity which a controlled system is made to perform is determined and the decision of the activity to complex feeling is attained, when the feeling of "joy" and "sadness" occurs simultaneously, it becomes possible to make a controlled system perform actuation of the content "he is absent-minded."

[0098] Moreover, the activity decision equipment according to claim 2 concerning this invention Since it determines that a feeling quantity of state will become a bigger numeric value than the time when the direction when strong is weak according to the strength of feeling in addition to said effectiveness of claim 1 When the same actuation is taken by the favorite user and the ordinary user, the direction of a favorite user's action by lifting of the quantity of state of feeling becomes possible [attaining both differentiation] by making it go up more greatly than an ordinary user.

[0099] Moreover, according to the activity decision equipment according to claim 3 to 5 concerning this invention In addition to said effectiveness according to claim 1 or 2, the amount of feeling experiences and feeling variation are determined. The actuation in which the flow of the feeling in consideration of the past feeling quantity of state is given in addition to the actuation to the complex feeling according to the feeling quantity of state at that time, and the reflecting actuation to change of intense feeling, Or since it becomes possible to make a controlled system perform actuation which a user is made to sense positiveness and is sold to him, it is possible to determine the activity which has a touch of reality reflecting the condition of feeling, for example to the controlled system of a pet mold robot, a still more advanced humanoid robot, etc.

[0100] Moreover, according to the activity decision equipment according to claim 6 to 9 concerning this invention As opposed to the activity of the controlled system which is set up beforehand in addition to said effectiveness according to claim 1 to 5 A feeling multiplier is set up. Either this multiplier, a feeling quantity of state and the amount of feeling experiences and feeling variation. Or since activity consideration reinforcement was determined for every activity, and this activity consideration reinforcement has determined activity from all, and it becomes possible to strengthen the connection with activity and each feeling, the decision of the suitable activity to a complicated change of feeling is attained.

[0101] Moreover, according to the activity decision equipment according to claim 10 concerning this invention Since total time amount while this quantity of state is over the predetermined threshold among the feeling quantity of states determined by the time it resulted [from the past] in either of claims 3, 5, 7, and 9 current in addition to said effectiveness of a publication is made into the amount of feeling experiences When the feeling quantity of state of the magnitude beyond a threshold continues and is determined in the past, the amount of feeling experiences serves as a big value, and influences also in the decision of activity consideration reinforcement strongly. Therefore, it becomes possible to determine the activity by which the condition of the past feeling was reflected in the controlled system by setting a threshold as a suitable value and adjusting activity consideration reinforcement etc.

[0102] Moreover, according to the activity decision equipment according to claim 11 concerning this invention Difference with predetermined values, such as a feeling quantity of state determined by the time it resulted [from the predetermined past] in either of claims 3, 5, 7, and 9 current in addition to said effectiveness of a publication, initial value of each feeling, or the average, is computed. Since the amount of feeling

experiences is determined by accumulating this difference, when the thing beyond the average has many feeling quantity of states of each feeling, the amount of feeling experiences serves as a big value, and affects the decision of activity consideration reinforcement etc. That is, even if the feeling of "joy" will be in a strong condition suddenly after the strong condition of the feeling of "sadness" continues for a long time for example, since the element of the feeling that many feeling quantity of states big in the past were determined to activity consideration reinforcement etc. is reflected strongly, it becomes possible for unsuitable activity, such as "dancing", to be made not to be determined with the amount of feeling experiences of sadness.

[0103] Moreover, according to the activity decision equipment according to claim 12 concerning this invention When the feeling quantity of state to specific feeling has satisfied the predetermined conditions set up beforehand in addition to said effectiveness according to claim 6 to 9 Since only the specified quantity can increase or decrease the value of the feeling over this feeling quantity of state among the feeling multipliers set as each activity and the connection with feeling and activity can be controlled It becomes possible to attach the description to the decision of the activity to change of the feeling of a controlled system.

[0104] Moreover, according to the activity decision equipment according to claim 13 concerning this invention When a user takes the actuation which induces specific feeling to a controlled system in addition to said effectiveness according to claim 7 or 9 When the amount of feeling experiences to the feeling exceeds a threshold, a controlled-system activity decision means Since the activity which serves as other candidates is disregarded and it comes to choose specific activity, when a controlled system is the pet mold robot by which the feeling of "joy" and "dislike" was set up, for example If the amount of feeling experiences of "joy" exceeds a threshold when a user loves If specific actuation of "a dance is danced", "turning round and round, **ing a tail", etc. is carried out, it is persistently stroked by the disagreeable user and the amount of feeling experiences of "dislike" exceeds a threshold There is interest to which it becomes possible to make it a pet mold robot which does "it escapes" and specific actuation of "turning to *****", and attachment springs [interest] and being easy weariness does not come for a user.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, by the above-mentioned conventional approach, in the time of, for example, a favorite user appearing suddenly in front of the pet mold robot by which the feeling of "joy", "dislike", and "surprise" was set up, and the time of a disagreeable user appearing, as for the former, the feeling of "joy" and "surprise" goes up, and the feeling of "dislike" descends. Moreover, the feeling of "dislike" and "surprise" will go up, and, as for the latter, the feeling of "joy" will descend. However, without doing what the actuation of "being surprised" is only returned, or "it is [a thing] surprised" when the feeling which went up most is "joy", and "dislike", since actuation to the feeling of the condition strongest against a pet mold robot is conventionally carried out to these both, for a user, such as "it dances", and "escaping" etc., it is dissatisfied and there is a possibility may return the actuation which lacked in interest.

[0004] moreover, a user -- a pet mold robot -- receiving -->["to stroke"] "it strikes" -> - - when actuation of "stroking" is performed continuously, activity is determined to that which is characteristic among the conditions of the feeling at that time for every actuation. that is, the feeling to which the condition of feeling went up greatly and, as for feeling, these-went up in order of "joy" ->"dislike" -> "joy" -- receiving -- the -- ** -- activity determined that it comes and will move aside will be performed. being [that / right], then ->["is danced"] "it escapes" -> -- in order to return the reaction to the condition of the feeling at the time of [each] the condition of front feeling being disregarded in the order of "dancing", a user becomes possible [predicting comparatively the activity accompanying change and it of a pet mold robot's feeling for a short period of time]. [pet mold robot] Consequently, as a pet mold robot, it is easy to get bored and there is a possibility of sensing as what lacked in interest.

[0005] Then, this invention is made paying attention to the unsolved technical problem which such a Prior art has. By being able to determine suitable activity to the complicated feeling condition with which two or more feeling mingled, and taking into consideration the variation of the condition of the past feeling, or the condition of feeling It aims at offering the activity decision equipment which can carry out actuation concerning the past experience, actuation in which positiveness is impressed to a controlled system.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object, the activity decision equipment according to claim 1 concerning this invention A controlled-system circumference information detection means to detect the information on the controlled-system circumference, and a controlled-system self-information detection means to detect self-information of a controlled system own [said], A feeling quantity of state decision means to determine the feeling quantity of state which expressed numerically the condition of two or more kinds of feeling set up beforehand, respectively based on said circumference information and said self-information, It is characterized by having a controlled-system activity decision means to determine the activity of said controlled system based on said all feeling quantity of states.

[0007] That is, own self-information of a controlled system, such as contact status information when the camera which detects the visual information on a controlled system besides being the speech information of the controlled-system circumference, light-and-darkness information, temperature information, etc. with a controlled-system circumference information detection means detecting a user's expression, the existence of actuation and an obstruction, etc., and being contacted by the attitude information of a controlled system, hungry information (dc-battery residue), and the user with a controlled-system self-information detection means, is detected. And a feeling quantity of state decision means determines numerically the condition of two or more kinds of feeling, such as "joy" beforehand set as the controlled system based on such information, and "resentment." Furthermore, decision of a feeling quantity of state determines the activity which a controlled system is made to perform with a controlled-system activity decision means based on the feeling quantity of state of the feeling of these all class.

[0008] For example, when a controlled system is used as a pet mold robot, the circumference information and self-information of a controlled system which were described above with the controlled-system circumference information detection means and the controlled-system self-information detection means are detected first. The change value of the feeling quantity of state of each feeling is beforehand set here to all the information that may be detected. When the feeling quantity of state of each synthetic feeling is determined by the same thing to do for feeling addition and "it is stroked" by the user, these change value As it said that "+50" was added to the quantity of state of "joy", and "-20" was added to the quantity of state of the "resentment" Lifting of a certain feeling sets up making it a value to which the feeling which becomes symmetrical descends etc. so that change characteristic of the quantity of state of the feeling relevant to each information detected may be carried out. and -- or it determines activity to the computed synthetic feeling quantity of state -- or -- further -- a hand -- in addition -- for example, the operation changed into one numeric value which included all feeling is carried out, and the content of action is determined to the result. Thus, if the content of action is determined based on all feeling, when "a pleasant thing" and "a painful thing" happen to a pet mold robot simultaneously, as opposed to the complicated feeling to which both the quantity of states of two feeling that "joy" and "sadness" conflict rose, it will become possible for a user to make a pet mold robot perform actuation with difficult prediction actually ["he is absent-minded" etc.].

[0009] Moreover, invention concerning claim 2 is characterized by said feeling quantity of state decision means determining that said feeling quantity of state will become a bigger numeric value than the time when the direction when strong is weak according to

the strength of said feeling in activity decision equipment according to claim 1. That is, the strong one expresses the quantity of state of the feeling of changing to the information detected, for a bigger numeric value than the weaker one to the strength of feeling.

[0010] For example, when this activity decision equipment is applied to the pet mold robot by which the feeling of "joy" and "sadness" was set up, if [this robot / each of a favorite user and an ordinary user] "Stroked" It becomes possible by in the case of a favorite user, expressing the degree of "joy" in numerical magnitude, as it was called "+20", when the quantity of states of "joy" were "+80" and an ordinary user to attain differentiation with a favorite user and an ordinary user. Moreover, since these two feeling conflicts when the quantity of state of "joy" and "sadness" is determined as "70" and "50" by determining a feeling quantity of state in this way, respectively, it also becomes possible to determine the content of action which performs the count $70-50=20$, re-determines the quantity of state "20" of "joy", and suits to this numeric value.

[0011] Moreover, while accumulating said feeling quantity of state as which invention concerning claim 3 was determined in activity decision equipment given in claim 1 or any 1 term of 2 by the time said controlled-system activity decision means resulted from the predetermined past now for every class of said feeling, respectively and determining the amount of feeling experiences, it is characterized by to determine said activity based on this amount of feeling experiences.

[0012] That is, a controlled-system activity decision means adds the feeling quantity of state determined by the present from the predetermined past for every class of feeling, calculates the synthetic numeric value (the amount of feeling experiences) of each feeling, and determines activity based on this amount of feeling experiences. For example, when this activity decision equipment was applied to the pet mold robot by which the feeling of "joy" and "sadness" was set up and the feeling quantity of state of "joy" changes with "20" \rightarrow "-100" \rightarrow "80", the amount of feeling experiences of "joy" is set to $20+(-100)+80=0$. Moreover, when the feeling quantity of state of "sadness" changes with "-20" \rightarrow "100" \rightarrow "-80", the amount of feeling experiences of "sadness" is set to $+(-20)100+(-80)=0$, and the content of action will be determined based on these amounts of feeling experiences. That is, although a change strong against the condition of "joy" had broken out, since current had a change strong against the feeling of "sadness" which disagrees with "joy" in the past in front of one, the feeling quantity of state of "joy" is set to "-100", it denies each other "20" which is a feeling quantity of state before and behind that, and "80", and the amount of feeling experiences has become "0." Similarly, in the case of the feeling of "sadness", the feeling quantity of state of the past in front of one is "100", denies "-20" which is a feeling quantity of state before and behind that, and "-80" mutually, and the amount of feeling experiences has become "0." Therefore, since it is in the condition which does not have change in feeling (the amount of feeling experiences is 0), it is determined activity "will be absent-minded." Thus, since activity is determined also in consideration of the condition of the past feeling by taking the sum of a feeling quantity of state, even if the feeling of current "joy" is in a strong condition, it becomes possible, when the feeling of "sadness" is in a strong condition immediately before to avoid unnatural actuation of "dancing" and to determine suitable activity. Here, although the thing of the value of "minus" is used for the feeling quantity of state, a feeling quantity of state may be set up so that it may not become below "0", and may carry out computing the difference of the amount of feeling experiences of "joy"

and "sadness" for which it asked on this condition and which are opposite feeling etc.
[0013] Moreover, in activity decision equipment given in claim 1 or any 1 term of 2, invention concerning claim 4 is characterized by determining said activity based on this feeling variation while it computes the variation of said feeling quantity of state as which said controlled-system activity decision means was determined in the predetermined past and the present for every class of said feeling, respectively and determines feeling variation.

[0014] That is, it asks for the degree of change of a feeling quantity of state by computing the difference of the feeling quantity of state in the predetermined past of a controlled system, and a current feeling quantity of state. For example, if this activity decision equipment is applied to the pet mold robot by which the feeling of "joy" was set up Although it is set to "20" and "80", respectively and the feeling quantity of state after change is the same if the difference is computed when the feeling quantity of state of "joy" changes to "80" "20" -> "100" with the case where it changes to -> "100", a difference produces fairly the variation which is the difference in the magnitude. And by making a pet mold robot perform reaction actuation which is different from the actuation to the usual "joy" when variation is "80" For example, a pet mold robot's reaction can be made into what [different] by the case "where it is stroked by the favorite user", and the case "where it is stroked by the ordinary user", both differentiation can be attained, and it becomes possible to make attachment to a pet mold robot easy to give a user.

[0015] Moreover, it is also possible to give a pet mold robot autonomy at reverse, as positive actuation of "a tail being wagged and approaching" is carried out so that actuation which raises the feeling quantity of state of "joy" to a user to a pet mold robot may be carried out, if the condition of "joy" has a slight change when the condition over "joy" of for example, a pet mold robot is weak.

[0016] Invention concerning claim 5 is set to activity decision equipment given in claim 1 or any 1 term of 2. Moreover, said controlled-system activity decision means While accumulating said feeling quantity of state determined by the time it resulted from the predetermined past now for every class of said feeling, respectively and determining the amount of feeling experiences It is characterized by computing the difference of said feeling quantity of state determined in the predetermined past and the present for every class of said feeling, respectively, determining feeling variation, and determining said activity based on said feeling quantity of state, said amount of feeling experiences, and said feeling variation.

[0017] That is, first, the quantity of state of feeling is determined, a feeling quantity of state until it next results from the predetermined past now is accumulated for every feeling, the amount of feeling experiences is determined, the variation of the feeling quantity of state of the further predetermined past and the present is computed, and feeling variation is determined. And a controlled-system activity decision means determines activity based on all these feeling quantity of states, the amounts of feeling experiences, and feeling variation. Therefore, it is complicated, and since it becomes difficult by carrying out the multi-statement of the activity corresponding to these since the condition of feeling with a touch of reality is set up for a user to guess the condition of feeling and the activity to the condition, manufacture of the pet mold robot with which it is hard to get bored, and attachment tends to spring is attained.

[0018] For example, if this activity decision equipment is applied to the pet mold robot

by which the feeling of "joy" and "sadness" was set up When the feeling quantity of state of "joy" changes with "20" ->"30" -> "50" and the feeling quantity of state of "sadness" changes with "30" ->"10" -> "20" Since the feeling quantity of state of "sadness" of the current feeling quantity of state of "joy" is "20" in "50", "100", "60", and feeling variation are computed for the amount of feeling experiences with "50" and "10", respectively. The difference of each feeling quantity of state with "sadness" which is the feeling which disagrees with "joy" when determining activity from these numeric values, the amount of feeling experiences, and feeling variation is computed. If it does so, a feeling quantity of state "30", the amount of feeling experiences "40", and feeling variation "40" can be found, respectively, and will determine a pet mold robot's feeling as a thing with a touch of reality by determining the numeric value which deducted each numeric value of these "sadness" from each numeric value of "joy", respectively as a numeric value of true "joy." And for example, since the numeric values previously calculated from this numeric value are "30", "40", and "40" supposing the average of each numeric value of the feeling quantity of state, the amount of feeling experiences, and feeling variation to the feeling of "joy" is "50", the activity to "joy" a little more nearly negative than the actuation performed to the average will be determined.

[0019] Moreover, according to invention concerning claim 6, it sets to activity decision equipment given in claim 1 or any 1 term of 2. The predetermined numeric value which associates all and this activity of said feeling for said every activity of two or more classes beforehand set as said controlled system is set up as a feeling multiplier. While said controlled-system activity decision means determines the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform said activity based on said feeling quantity of state and said feeling multiplier for said every activity It is characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[0020] That is, suppose that the activity of "it is glad", "it feeling sad", "observing", etc. is set up, and three, "joy", "sadness", and the "resentment", are set up as feeling as opposed to a controlled system. First, if a feeling quantity of state is determined as "5" to the feeling of "10" and the "resentment" to the feeling of "30" and "sadness" to the feeling of "joy" A feeling multiplier receives the feeling of "joy" to the activity of "being glad". For example, "+10", If this multiplier is integrated, respectively with each feeling quantity of state of "joy", "sadness", and the "resentment" when being set up with "-10" to the feeling of "-10" and the "resentment" to the feeling of "sadness", respectively for example To "joy", the numeric value of "-50" is computed to "-100" and the "resentment" to "300" and "sadness", respectively. And for example, the numeric value "150" is computed to $(300+(-100)+(-50)=150)$ and the activity of "being glad" by adding these addition results. Here, this numeric value serves as activity consideration reinforcement.

[0021] Thus, it becomes possible by adding, after integrating, as each feeling multiplier and a corresponding feeling quantity of state were described above, or starting a diploid value by other operations to tie up the feeling and each activity of all classes. Supposing it also receives "it feels sad" and "it observing" similarly and is set as the feeling that a feeling multiplier is three, "joy", "sadness", and the "resentment", with -7, "10, 5", and "0, 5, 0", respectively, activity consideration reinforcement will be computed with "-85" and "50", respectively. Therefore, to activity "it is glad", it receives "150" and "it feeling sad", receives "-85" and "it observing", and "50" is determined as activity consideration

reinforcement, respectively.

[0022] And in case activity is determined actually, the magnitude of these activity consideration reinforcement is compared, respectively, and it being decided that it will be the activity of the largest numeric value, or making a controlled system perform specific activity etc., when the activity consideration reinforcement to specific activity is [more than / for example, / more than below "100" or "500"] sets up the predetermined conditions of determining activity, and it determines it according to the condition, for example.

[0023] A feeling multiplier is a numeric value which associates the activity set up beforehand and each feeling here, for example, it receives "it being glad". When the feeling quantity of state of "joy" is large, [of activity] The big value of the sign of "plus" is set up as a feeling multiplier so that this activity may become is easy to be chosen, and it is set as the big value of the sign of "minus" so that "it is glad" may not be chosen as reverse to the feeling of "sadness", when this feeling quantity of state is large. [of activity] If it does in this way, when the feeling quantity of state of "joy" is [the quantity of state of "50" and "sadness"] "20", it receives "it being glad". A feeling multiplier to the feeling of "joy" "+10", [of activity] When set as the feeling of "sadness" with "-8", activity consideration reinforcement If it is the same calculation approach as the above, will be set to "340", and when the feeling quantity of state of "joy" is [the feeling quantity of state of "20" and "sadness"] "50" Since the activity consideration reinforcement which receives "it being glad" is set to "-200", when determining as activity to which a controlled system performs the largest thing of this numeric value, as for the former, "to be glad" is easy to be chosen, and the latter becomes that it is hard to be chosen. [of activity]

[0024] Moreover, according to invention concerning claim 7, it sets to activity decision equipment according to claim 3. The predetermined numeric value which associates said feeling and this activity for said every activity of two or more classes beforehand set as said controlled system is set up as a feeling multiplier. While said controlled-system activity decision means determines the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform said activity based on said amount of feeling experiences, and said feeling multiplier for said every activity It is characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[0025] To above-mentioned claim 3, like the activity decision equipment of a publication that is, with a controlled-system activity decision means Based on each detected information, determine the amount of feeling experiences of each feeling, and the amount of experiences of each feeling and a corresponding feeling multiplier are integrated for every activity like the activity decision equipment of a publication to above-mentioned claim 6, for example. Furthermore, activity consideration reinforcement is determined by adding the result. In this case, since the feeling multiplier is integrated to the amount of feeling experiences, the activity consideration reinforcement in consideration of a feeling quantity of state until it results [from the predetermined past of a feeling quantity of state] in current will be determined. Therefore, since the feeling which had many conditions that a feeling quantity of state was large, in the past is reflected in activity consideration reinforcement Even if it is a numeric value with the big feeling quantity of state of current "joy", when the feeling quantity of state of a big numeric value is continuing

being determined as immediately before to "sadness" Since the activity consideration reinforcement to activity, such as "dancing", serves as a small value and the activity consideration reinforcement to activity, such as "falling", serves as a big value, unnatural activity is avoided and it becomes possible to determine suitable activity.

[0026] Moreover, according to invention concerning claim 8, it sets to activity decision equipment according to claim 4. The predetermined numeric value which associates said feeling and this activity for said every activity of two or more classes beforehand set as said controlled system is set up as a feeling multiplier. While said controlled-system activity decision means determines the activity consideration reinforcement which expressed numerically the strength of the consideration for said controlled system to perform said activity based on said feeling variation and said feeling multiplier for said every activity It is characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[0027] That is, like activity decision equipment given in above-mentioned claim 4, the variation of the feeling quantity of state of each feeling of the predetermined past and the present is computed, feeling variation is determined, and like activity decision equipment given in above-mentioned claims 6 and 7, each feeling variation and a feeling multiplier are integrated for every activity, and activity consideration reinforcement is determined by adding the calculation result further. In this case, since the feeling multiplier is integrated to feeling variation, the activity consideration reinforcement in consideration of the degree of change of a feeling quantity of state will be determined. When there is an abrupt change of feeling, a big change will arise about activity consideration reinforcement. Therefore, for example, the feeling of "joy" and "sadness", When this activity decision equipment is applied to the pet mold robot by which "it dancing" and "its head is hung" were set up, [of activity] Supposing the feeling quantity of state of "joy" changes to "30" -> "50" and the feeling quantity of state of "sadness" changes to "10" -> "50", the variation For example, if the difference of the feeling quantity of state of change before and the back is taken, it will be set to "20" and "40", respectively, and the direction of the feeling of "sadness" will serve as big variation. "in this case, activity - its head is hung, saying" "it dances" -- receiving -- a feeling multiplier -- respectively -- the feeling of "joy" and "sadness" -- receiving -- "10, -6" -- and -- ", supposing it is set up with -6 and 10" Since activity consideration reinforcement receives "it dances", receives "-40" and "its head being hung" and computed with "440" Supposing it is the decision approach by which the largest thing of this numeric value is determined as activity which a pet mold robot performs, it is the numeric value as which the direction of "hanging one's head" which is the activity relevant to the feeling of great "sadness" of variation is easy to be determined. Thus, it becomes possible to make actuation like a conditioned reflex of being able to withdraw a hand quickly [when that of a heat potato is touched suddenly] by making it easy [the activity concerning the large feeling of the variation of a feeling quantity of state] a lifting into a controlled system. However, detection of contact temperature is needed as self-information in this case.

[0028] Moreover, according to invention concerning claim 9, it sets to activity decision equipment according to claim 5. The predetermined numeric value which associates said feeling and this activity for said every activity of two or more classes beforehand set as said controlled system is set up as a feeling multiplier. While said controlled-system activity decision means determines the activity consideration reinforcement which

expressed numerically the strength of the consideration for said controlled system to perform this activity based on this feeling multiplier, said feeling quantity of state, said amount of feeling experiences, and said feeling variation for said every activity It is characterized by determining the activity of said controlled system based on this activity consideration reinforcement.

[0029] That is, the feeling quantity of state, the amount of feeling experiences, and feeling variation of each feeling are determined as above-mentioned claim 5 to each detected information like the activity decision equipment of a publication. Moreover, like activity decision equipment given in above-mentioned claims 6-8, a feeling quantity of state, the amount of feeling experiences and feeling variation, and a feeling multiplier are integrated for every activity, and activity consideration reinforcement is determined by adding the calculation result further. In this case, since a feeling quantity of state, the amount of feeling experiences and feeling variation, and a feeling multiplier are integrated, activity consideration reinforcement will be determined in consideration of hysteresis until it results [from the condition of current feeling, and the past of a feeling quantity of state] in current, and the degree of change of a feeling quantity of state. Here, a feeling multiplier sets up a respectively different thing to a feeling quantity of state, the amount of feeling experiences, and feeling variation. For example, if this activity decision equipment is applied to the pet mold robot by which "it dances" was set up as activity and "joy" and "sadness" were set up as feeling First, if "80, 20", and feeling variation are determined for "30, 5", and the amount of feeling experiences as "20, 0", respectively, the feeling quantity of state of "joy" and "sadness", respectively Receive "it dancing" and "5, -2", and a feeling multiplier are set as the feeling of "joy" and "sadness" to the feeling quantity of state. [of activity] Supposing it is set up with "5, -5" to "3, -3", and feeling variation to the amount of feeling experiences, similarly activity consideration reinforcement To "140" and the amount of feeling experiences, it is set to "100" to "180" and feeling variation to a feeling quantity of state, and in these, by adding all, synthetic activity consideration reinforcement is computed as "140+180+100=420", and is determined. In this case, the magnitude of the feeling [reinforcement / activity consideration] quantity of state at that event, It becomes the numeric value in which all the properties of the hysteresis of a feeling quantity of state until it results [from the past] in current, and the variation of a feeling quantity of state were included. Since it becomes the activity consideration reinforcement corresponding to the condition of feeling more complicated than the activity consideration reinforcement which used and computed each of a feeling quantity of state at present, the amount of feeling experiences, and feeling variation alone By setting up much activity corresponding to these conditions, it becomes possible to determine the activity which is rich in versatility and has a touch of reality.

[0030] According to invention concerning claim 10, it sets to activity decision equipment given in any 1 term of claims 3, 5, 7, and 9. Moreover, said controlled-system activity decision means It is characterized by comparing said feeling quantity of state determined by the time it resulted [from the predetermined past] in current with the predetermined threshold set up beforehand, and the direction of said feeling quantity of state making total time amount said amount of feeling experiences in succession than said threshold, while it is large.

[0031] That is, it is what made total time amount while this quantity of state is over the

predetermined threshold among the feeling quantity of states determined by the time it resulted [from the past] in current the amount of feeling experiences, even if there is what has a large feeling quantity of state in single shot in this case, it is ignored, and that amount of feeling experiences serves as as big a value as the feeling that the condition of the magnitude beyond a threshold continues for a long time. For example, suddenly, when the feeling quantity of state of "joy" continues for a long time above the threshold, since the amount of feeling experiences serves as a big value to "joy" even if the feeling quantity of state of "sadness" has a big change, the condition of the big feeling of "sadness" at present will be eased by the amount of feeling experiences of "joy", or it will be denied. Therefore, since it becomes a value with the big amount of feeling experiences as it described above, when the feeling quantity of state of the magnitude beyond a threshold followed reverse in the past and it was determined, although it did not become a value with the big amount of feeling experiences even if there was change of the feeling [that it is big in the past] quantity of state in single shot, and it did not have big effect about activity consideration reinforcement etc., it influences also in the decision of activity consideration reinforcement strongly. Therefore, it becomes possible to determine the activity by which the condition of the past feeling was reflected in the controlled system by setting a threshold as a suitable value and adjusting activity consideration reinforcement etc.

[0032] moreover, difference with the predetermined value which set up said controlled-system activity decision means beforehand with said feeling quantity of state in activity decision equipment given in any 1 term of claims 3, 5, 7, and 9 according to invention concerning claim 11 -- every class of said feeling -- computing -- this -- it is characterized by accumulating difference and determining said amount of feeling experiences. That is, difference with predetermined values, such as a feeling quantity of state determined by the time it resulted [from the predetermined past] in current, initial value of each feeling, or the average, is computed, and the amount of feeling experiences is determined by accumulating this difference. In this case, unlike a case so that it may decide on the total time amount which is over the threshold in succession [by the time it results / from the predetermined past / in current like activity decision equipment given in above-mentioned claim 10] as the amount of feeling experiences, difference with a predetermined value is taken to all the target feeling quantity of states. For example, when a predetermined value is made into the average, having used the lower limit of difference as "0", since only that to which the feeling quantity of state exceeded the average serves as a bigger value than "0", it will accumulate, and all the feeling quantity of states below the average are disregarded. Therefore, when the thing beyond the average has many feeling quantity of states of each feeling, the amount of feeling experiences serves as a big value, and affects the decision of activity consideration reinforcement etc. Even if the feeling of "joy" will be in a strong condition suddenly after the strong condition of the feeling of "sadness" continues for a long time for example, since the element of the feeling that many feeling quantity of states big in the past were determined to activity consideration reinforcement etc. by carrying out like this is reflected strongly, it becomes possible for unsuitable activity, such as "dancing", to be made not to be determined with the amount of feeling experiences of sadness.

[0033] Moreover, according to invention concerning claim 12, in activity decision equipment given in any 1 term of claim 6 - claim 9, said controlled-system activity

decision means is characterized by updating said feeling multiplier based on said feeling quantity of state. That is, predetermined conditions are set up as opposed to the feeling quantity of state, and when the feeling quantity of state of the target feeling becomes the value with which the condition is filled, the multiplier value over the feeling with which the conditions of each feeling multiplier set up for every activity were filled is updated.

[0034] Moreover, it is the renewal of a feeling multiplier increasing the multiplier value of the feeling with which conditions' were filled, and strengthening the connection with the feeling and activity. [whether when the feeling quantity of state of the feeling rises, it is made for activity with the strong feeling and connection to become that it is easy to be determined, and] Or a multiplier value is decreased conversely and it is made for the activity which is easy to perform at the time of lifting of the feeling quantity of state of the feeling to become by weakening the connection with the feeling that it is hard to be determined.

[0035] Therefore, when increasing a feeling multiplier, [for example,] When this activity decision equipment is applied to the pet mold robot of a dog by which "a tail is wagged" and "stability is carried out" were set up as activity, a user by what [time amount / long / a thing / "it strokes"] When the feeling multiplier value of "joy" which receives "a tail being wagged" rises next, it comes to perform "a tail being wagged" for this robot immediately, saying "it strokes". [of activity] [of activity] That is, it becomes possible to lifting of "joy" to return the reaction sensitively by increasing the feeling multiplier of "joy" which receives "a tail is wagged."

[0036] When decreasing a feeling multiplier conversely, moreover, this activity decision equipment as activity -- "throat -- a grounder -- a grounder -- when it applies to the pet mold robot of a cat by which *****" and "***** is turned to" were set up, a user by what [time amount / long / a thing / "it strokes"] "throat of activity -- a grounder -- a grounder -- if a user takes the same action when the feeling multiplier to *****" decreases next -- "throat of activity -- a grounder -- a grounder -- since *****" became is hard to be determined, it comes to determine "to turn to *****" as activity. That is, a controlled system becomes possible [setting up the condition of "getting used"] by decreasing a feeling multiplier to the specific action which a user repeats.

[0037] In addition, when predetermined conditions are fulfilled, you may make it not only a feeling quantity of state at present but the amount of feeling experiences or feeling variation update a feeling multiplier. Thus, the decision of the activity to change of the feeling of a controlled system is controlled by updating a feeling multiplier under predetermined conditions, and it becomes possible to attach the description to the decision of the activity to change of the feeling of a controlled system.

[0038] According to invention concerning claim 13, it sets to activity decision equipment given in any 1 term of claims 7 and 9. Moreover, said controlled-system activity decision means It is characterized by comparing said amount of feeling experiences determined to said feeling of a specific class with the predetermined threshold set up beforehand, and determining the activity of said controlled system as a specific thing, when this amount of feeling experiences is larger than said threshold.

[0039] For example, when the thing of "rioting" is set up as specific activity when the amount of feeling experiences of the "resentment" exceeds a threshold If the amount of feeling experiences to the feeling of the "resentment" exceeds a threshold when the user took the actuation which induces the "resentment" to a controlled system, a controlled-

system activity decision means will disregard the activity which serves as other candidates, and will come to choose "it rioting". [which is specific activity] Thus, by making it make a controlled system perform specific actuation, when each amount of feeling experiences exceeds a threshold for example, when a controlled system is the pet mold robot by which the feeling of "joy" and "dislike" was set up If the amount of feeling experiences of "joy" exceeds a threshold when a user loves If specific actuation of "a dance is danced", "approaching, **ing a tail", etc. is carried out, it is persistently stroked by the disagreeable user and the amount of feeling experiences of "dislike" exceeds a threshold It becomes possible to make it a pet mold robot which does "it escapes" and specific actuation of "turning to *****", and there is interest to which attachment springs [interest] and being easy weariness does not come for a user.

[0040]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained based on a drawing. Drawing 1 thru/or drawing 8 are drawings showing the gestalt of operation of the 1st of the activity decision equipment concerning this invention, and the gestalt of the 2nd operation. Drawing 1 is the block diagram showing the configuration of the activity decision equipment 1 concerning this invention.

[0041] Activity decision equipment 1 Circumference information detection equipment 2 and self-information detection equipment 3, Feeling quantity of state decision equipment 5, controlled-system activity decision equipment 6, and ROM the program for controlling actuation of each equipment was remembered to be although not illustrated, It consists of a central processing unit (CPU) for performing a program, RAM for memorizing the data used by the program, and the I/F section for transmitting data between each equipment. Moreover, two or more kinds of feeling is set to the controlled system.

[0042] Camera 2a to which circumference information detection equipment 2 detects the visual information on a controlled system, From the information detected with microphone 2b which detects surrounding speech information, and camera 2a and microphone 2b It consists of the description information extract sections 4 which extract the characteristic information to which the feeling change value is set beforehand. To camera 2a by the description information extract section 4 for example, when a person is reflected As for judgment of being a user, and a user's case, distance with the person and its person extract the activity etc. from the information, and when a ball etc. is reflected in others, the color information etc. is extracted. Moreover, the size of sound volume or a user's content of conversation is extracted from the speech information of the circumference detected with microphone 2b. The extracted description information is transmitted to feeling quantity of state decision equipment 5.

[0043] Moreover, pressure-sensitive sensor 3a which detects the load to which the thing in contact with a controlled system gives self-information detection equipment 3 to the contact section, It consists of the description information extract sections 4 which extract characteristic information from the information detected by temperature sensor 3b which detects the temperature of the contactant, and pressure-sensitive sensor 3a and temperature sensor 3b. By the description information extract section 4 The contact information produced by contact of an object, such as "it was struck" and "it having been stroked", is extracted from the magnitude of the load applied to the detected contact section by pressure-sensitive sensor 3a etc. as description information. By moreover, temperature sensor 3b Information with the descriptions, like "it is "hot" and cold" is

extracted from the temperature of the detected contactant. The extracted description information is transmitted to feeling quantity of state decision equipment 5.

[0044] Moreover, feeling quantity of state decision equipment 5 consists of feeling quantity of state database 5a which memorized the change value of the feeling quantity of state of each feeling beforehand, and feeling quantity of state decision section 5b which determines the synthetic feeling quantity of state of each feeling from the change value set as each feeling for every description information to the description information extracted. The determined feeling quantity of state is transmitted to controlled-system activity decision equipment 6. Here, the description information selects in advance information with the description which is likely to affect the feeling of a controlled system from information detectable [with circumference information detection equipment 2 and controlled-system self-information detection equipment 3].

[0045] And feeling quantity of state storage 6a which memorizes the synthetic feeling quantity of state of each feeling that controlled-system activity decision equipment 6 was determined by feeling quantity of state decision equipment 5, It consists of activity decision section 6b which determines the activity which a controlled system is made to perform. Feeling quantity of state storage 6a All the feeling quantity of states determined as the predetermined period are memorized. Feeling quantity of state decision section 6b It is based on the feeling quantity of state at present determined by the past feeling quantity of state and feeling quantity of state decision section 5b which are memorized by feeling quantity of state storage 6a. The amount of feeling experiences, Feeling variation is computed, activity consideration reinforcement is computed from the feeling multiplier determined for every these calculation result and activity beforehand set as the controlled system, and the activity which a controlled system is made to perform based on this activity consideration reinforcement is determined. The determined activity is transmitted to the activity activation section.

[0046] The amount of feeling experiences reads the feeling quantity of state determined as the past predetermined period from feeling quantity of state storage 6a here. The feeling quantity of state of the same feeling is determined by starting by operations, such as ****. Feeling variation In this configuration, since the feeling quantity of state is dealt with as discrete data, the feeling quantity of state determined as the predetermined past is read from feeling quantity of state storage 6a, and it determines by taking the difference of this and the feeling quantity of state at present determined by feeling quantity of state decision section 5b. Furthermore, activity consideration reinforcement asks for a feeling quantity of state, the amount of feeling experiences and feeling variation, and the feeling multiplier set up for every activity by starting by operations, such as addition and ****. And the decision of activity sets up conditions according to the property of a controlled system, and determines that the magnitude of the activity consideration reinforcement of each activity is compared, and it is decided that it will be the activity of the largest numeric value etc. according to the condition.

[0047] Drawing 2 - drawing 4 are flow charts which show an example of the processing of operation in each above-mentioned equipment. Hereafter, processing of each equipment of operation is explained based on drawing 2 - drawing 4 . Drawing 2 is a flow chart which shows processing of the main program which controls processing of the whole activity decision equipment 1 of operation. First, as shown in drawing 2 , while it shifts to step S200 and camera 2a and microphone 2b detect circumference information,

by pressure-sensitive sensor 3a and temperature sensor 3b, self-information is detected, a detection result is transmitted to the description information extract section 4, and it shifts to step S202.

[0048] If it shifts to step S202, by the description information extract section 4, the description information will be extracted from the detected circumference information and self-information, and it will transmit to feeling quantity of state decision equipment 5, and will shift to step S204. If it shifts to step S204, by performing the subprogram S1 which performs processing which computes the feeling quantity of state of each feeling, a feeling quantity of state will be determined, the result will be acquired, and it will shift to step S206.

[0049] If it shifts to step S206, the determined feeling quantity of state will be shifted to writing and step S208 at feeling quantity of state storage 6a. At step S208, by performing the subprogram S2 which performs processing which determines the activity which a controlled system is made to perform, activity is determined, the result is acquired and it shifts to step S210.

[0050] If it shifts to step S210, the determined activity will be transmitted to the activity activation section, and it will shift to step S200. Therefore, in the above-mentioned main program, activity is determined as real time by carrying out by repeating processing of step S200 - step S210 for every predetermined period.

[0051] Drawing 3 is a flow chart which shows processing of a subprogram S1. Hereafter, a flow of operation is explained based on drawing 3. With the gestalt of this operation, feeling of a controlled system is made into two kinds, a and b, and the description information acquired is set to X, Y, and Z. First, it shifts to step S300, and from feeling quantity of state database 5a, the change value of the feeling quantity of state of each feeling beforehand set up to the description information extracted by the description information extract section 4 is read, and it shifts to step S302. Here, the change value of a feeling quantity of state is carried out [having set up as taX, taY, taZ, tbX, tbY, and tbZ and] to X, Y, Z, and Feeling a and b of the description information, respectively.

[0052] processing will be ended if the feeling quantity of state which determined the synthetic feeling quantity of state according to the formula (1) shown below and (2), respectively, and was determined is returned to a main program from the change value of the feeling quantity of state of the feeling a and b which carried out reading appearance when it shifted to step S302.

$$Pa=taX+taY+taZ \dots\dots\dots (1)$$

$$Pb=tbX+tbY+tbZ \dots\dots\dots (2)$$

However, the synthetic feeling quantity of state to Feeling a and b is set to Pa and Pb, respectively. Therefore, the feeling quantity of state Pa to Feeling a is computed by taking total of taX-taZ, and the feeling quantity of state Pb to Feeling b is similarly computed by taking total of tbX-tbZ.

[0053] Although the above-mentioned formula (1) and (2) calculate by performing a subprogram S1 here, this formula is a formula when two kinds, a and b, are set up as feeling and three, X, Y, and Z, are set up as description information, and can set up actual more much feeling and the description information. In that case, the above-mentioned formula of number of feeling will increase, and **** for the description information number will be performed for every formula.

[0054] Drawing 4 is a flow chart which shows processing of a subprogram S2. Hereafter,

a flow of operation is explained based on drawing 4 . Here, suppose that alpha, beta, and gamma are set up as activity which a controlled system can perform. First, it shifts to step S400, and all the feeling quantity of states determined as the predetermined past are read from feeling quantity of state storage 6a, and it shifts to step S402. Here, since it is in the condition that only the feeling quantity of state at present is computed when it comes to this step for the first time, predetermined initial value will be called. Here, it supposes that two feeling quantity of states of the before [one] of the feeling quantity of state determined before two are read, respectively to Feeling a and b, and a feeling quantity of state is set to Pb1, Pb2, and Pb3 from an old thing to Pa1, Pa2, Pa3, and Feeling b at order to Feeling a, respectively.

[0055] If it shifts to step S402, according to the formula (3) shown from the feeling quantity of states Pa3 and Pb3 at present determined by feeling quantity of state decision section 5b, the feeling quantity of states Pa1 and Pa2 by which reading appearance was carried out, and Pb1 and Pb2 below, and (4), the amount of feeling experiences of Feeling a and b will be computed, respectively, and it will shift to step S404.

$$Ia=Pa1+Pa2+Pa3 \dots\dots\dots (3)$$

$$Ib=Pb1+Pb2+Pb3 \dots\dots\dots (4)$$

However, the amount of feeling experiences to Feeling a and b is set to Ia and Ib, respectively. Therefore, the amount Ia of feeling experiences to Feeling a is computed by taking total of Pa1-Pa3, and the amount Ib of feeling experiences to Feeling b is similarly computed by taking total of Pb1-Pb3.

[0056] If it shifts to step S404, feeling variation will be computed according to the formula (5) which calculates the feeling variation shown below from the feeling quantity of state determined as the past read from feeling quantity of state storage 6a, and the feeling quantity of state at present determined by feeling quantity of state decision section 5b, and (6), and it will shift to step S406.

$$Da=Pa3-Pa2 \dots\dots\dots (5)$$

$$Db=Pb3-Pb2 \dots\dots\dots (6)$$

However, feeling variation is set to Da and Db to Feeling a and b, respectively.

[0057] In addition, when it comes to this step for the first time, the value of the predetermined past turns into initial value. Therefore, the feeling variation Da to Feeling a computes the difference of the feeling quantity of state Pa 2 and the feeling quantity of state Pa of ***** 3 which were determined before one, and the feeling variation Db to Feeling b is similarly determined by computing the difference of Pb2 and Pb3. a step -- S -- 406 -- shifting -- if -- this time -- feeling -- a quantity of state -- having computed -- feeling -- an experience -- an amount -- and -- feeling -- variation -- feeling -- a multiplier -- from -- the following -- being shown -- a formula -- (-- seven --) - (-- nine --) -- following -- activity consideration reinforcement -- computing -- step S408 -- shifting .

The feeling multiplier to Activity alpha, beta, and gamma and the feeling quantity of states Pa and Pb at present here It is referred to as kPaalpha, kPabeta, kPagamma, kPbalpha, kPbbeta, and kPbgamma, respectively. The feeling multiplier to the amounts Ia and Ib of feeling experiences, respectively Moreover, kIalpha, It is referred to as kIabeta, kIagamma, kIbalpha, kIbbeta, and kIbgamma, and further, if the feeling multiplier to the feeling variation Da and Db is set to kDaalpha, kDabeta, kDagamma, kDbalpha, kDbbeta, and kDbgamma, respectively, activity consideration reinforcement will be called for by the following formulas.

[0058]

$M_{\alpha} = (k_{Pa} \alpha * Pa) + (k_{Ia} \alpha * Ia) + (k_{Da} \alpha * Da) + (k_{Pb} \alpha * Pb) + (k_{Ib} \alpha * Ib) + (k_{Db} \alpha * Db) \dots\dots\dots (7)$

$M_{\beta} = (k_{Pa} \beta * Pa) + (k_{Ia} \beta * Ia) + (k_{Da} \beta * Da) + (k_{Pb} \beta * Pb) + (k_{Ib} \beta * Ib) + (k_{Db} \beta * Db) \dots\dots\dots (8)$

$M_{\gamma} = (k_{Pa} \gamma * Pa) + (k_{Ia} \gamma * Ia) + (k_{Da} \gamma * Da) + (k_{Pb} \gamma * Pb) + (k_{Ib} \gamma * Ib) + (k_{Db} \gamma * Db) \dots\dots\dots (9)$

That is, as shown in above-mentioned formula (7) - (9), for every activity which this controlled system beforehand set as the controlled system is made to perform, activity consideration reinforcement integrates each of the feeling quantity of states Pa and Pb, the amounts Ia and Ib of feeling experiences, and the feeling variation Da and Db, and the above-mentioned feeling multiplier, and computes them further by carrying out the guide peg of the whole of the integrated value.

[0059] Moreover, a feeling multiplier is for connecting each feeling and activity, is integrating this numeric value, respectively with the feeling quantity of states Pa and Pb, the amounts Ia and Ib of feeling experiences, and the feeling variation Da and Db, and computes first the connection with these values and the activity beforehand set as the controlled system, respectively. Here, although a feeling quantity of state, the amount of feeling experiences, and especially feeling variation can compute activity consideration reinforcement independently to each even if they do not combine, they compute the activity consideration reinforcement which collected to one the property which each of a feeling quantity of state, the amount of feeling experiences, and feeling variation has by combining these all with the gestalt of this operation.

[0060] If it shifts to step S408, the activity consideration reinforcement computed for every activity will be measured according to the predetermined conditions set up beforehand, and it will shift to step S410. That is, predetermined conditions are determining conditions for determining the activity which a controlled system is made to perform from the computed activity consideration reinforcement of determining to the consideration reinforcement which was beforehand set as the controlled system and which was computed for every activity as activity which numerical magnitude is compared [activity] and makes a controlled system performing activity of a thing with the biggest value etc.

[0061] All processings will be ended if the activity which determined the activity with which activity consideration reinforcement agreed on predetermined conditions as activity which a controlled system is made to perform, and determined it when it shifted to step S410 is returned to a main program. In addition, formula (3) - (9) is added to the conditions applied to a formula (1) and (2). Since it becomes a formula at the time of setting up three, alpha, beta, and gamma, as activity which a controlled system is made to perform, and setting up the above-mentioned feeling multiplier to such each activity and Feeling a and b, in practice The number of number [the increase of the arity of a formula and] of activity set up of formulas will increase only the number of the feeling set as the controlled system.

[0062] Next, actual actuation of the activity decision equipment 1 in the gestalt of this operation is explained. In addition, on the occasion of explanation, the case where activity decision equipment 1 is applied to a pet mold robot will be dealt with. first, it being made to correspond to a of the above-mentioned feeling, and b as a pet mold

robot's feeling, and two kinds, "joy" and "sadness", being set up, respectively, and "people being seen" as description information -- "-- stroking -- " -- "-- striking -- " -- seven "it is loud being the "sound", "gesture could be seen", hot ["hot"], and cold" are set up. And it is made to correspond to Above alpha, beta, and gamma as activity, and three, "it apes", are set up, respectively. ["he is "glad" and absent-minded" and] Furthermore, as a change value of a feeling quantity of state, the response of the content and change value was made into the table for feeling quantity of state database 5a which set up the change value for every class of each feeling as drawing 5 . However, the set-up change value of the numeric value used actually is unrelated.

[0063] First, with circumference information detection equipment 2 and self-information detection equipment 3, circumference information and self-information are detected and such information is transmitted to the description information extract section 4 (step S200). And if it shifts to step S202, what agrees with the description information set up beforehand will be extracted from these detection information. Here, suppose that the figure of those who are present in the direction of a long distance at camera 2a was reflected as circumference information. Moreover, nothing is especially detected by microphone 2b and pressure-sensitive sensor 3a, but suppose at temperature sensor 3b that the temperature set up as ordinary temperature (for example, 20 degrees) was detected. Therefore, "people are seen" is extracted from the detected information by the description information extract section 4 as description information.

[0064] If it shifts to step S204, a main program will perform a subprogram S1 and will shift to step S300. At step S300, the change value of the feeling quantity of state set up by receiving "people are seen" is read from feeling quantity of state database 5a. Therefore, "15" is carried out for the front twist of drawing 5 , and "joy", and reading appearance of the change value is carried out for "sadness" to "-30." performing this step, if it shifts to step S302 -- for the first time -- ** -- since it becomes, and the extracted description information is "people are seen" when the whole of each feeling becomes initial value (the gestalt of this operation 0) and a synthetic feeling quantity of state is computed according to a formula (1), that change value serves as a feeling quantity of state as it is. That is, to "joy and sadness" of feeling, a current synthetic feeling quantity of state is determined as "15, 0", returns this value to a main program, and ends processing. However, suppose that the feeling quantity of state of each feeling is not become a numeric value below "0" with the gestalt of this operation.

[0065] At step S206, the determined feeling quantity of state is memorized to feeling quantity of state storage 6a, and it shifts to step S208. At step S208, a subprogram S2 is performed, it shifts to step S400, and two feeling quantity of states determined as the past are read from feeling quantity of state storage 6a in step S400. however, performing this step -- for the first time -- ** -- since it becomes, it becomes initial value (the gestalt of this operation 0) except [all] a current feeling quantity of state. That is, all of the feeling quantity of state "Pa1, Pa2" in above-mentioned formula (3) - (6), and "Pb1, Pb2" are set to "0" whose a value is initial value.

[0066] Since all the past feeling quantity of states will be set to "0" although the amount of feeling experiences is computed according to a formula (3) and (4) from "15, 0" to "joy and sadness" of a current feeling quantity of state, and the past feeling quantity of state (all 0) if it shifts to step S402, "0" will be added to a current feeling quantity of state in this case. therefore, a current feeling quantity of state -- as it is -- the amount of feeling

experiences -- becoming -- feeling -- "-- it is glad and the amount of feeling experiences to sadness" "Ia, Ib" is set to "15, 0."

[0067] And if it shifts to step S404, at this step, feeling variation will be computed for the predetermined past as the past in front of one according to a formula (5) and (6) from the feeling quantity of state in front of one (all 0), and a current feeling quantity of state. Also in this case, it becomes the same value as a current feeling quantity of state like the amount of feeling experiences. namely, feeling -- "-- it is glad and the feeling variation "Da, Db" to sadness" is set to "15, 0."

[0068] If it shifts to step S406, the activity consideration reinforcement to all the activity that a pet mold robot performs will be computed according to formula (7) - (9) from a feeling quantity of state, the amount of feeling experiences, current feeling variation, and a current feeling multiplier. therefore, activity consideration on-the-strength Malpha which receives "it being glad" -- formula (7) $Malpha = (kPaalpha * 15) + (kIalpha * 15) + (kDaalpha * 15) + (kPbalpha * 0) + (kIbalpha * 0) + (kDbalpha * 0) = 15 * (kPaalpha + kIalpha + kDaalpha) \dots\dots\dots (10)$ [of activity]

a next door, activity consideration on-the-strength Mbeta which receives activity "is absent-minded" and "it aping" similarly, and M gamma -- respectively -- a formula (8) and formula (9) $Mbeta = 15 * (kPabeta + kIabeta + kDabeta) \dots\dots\dots (11)$

$Mgamma = 15 * (kPagamma + kIagamma + kDagamma) \dots\dots\dots (12)$

It becomes.

[0069] In this case, since it is in the condition which "people are seen" is only extracted as description information, and does not have the past data, all of a feeling quantity of state, the amount of feeling experiences, and feeling variation are the same numeric values. Here, based on drawing 7 which is the table showing an example of a feeling multiplier, activity consideration reinforcement is computed actually and the activity which a pet mold robot is made to perform actually is determined based on the flow chart of drawing 6 which shows an example of the determining condition of activity.

[0070] The front twist of drawing 7 , and the feeling multiplier which receives "it being glad" [of activity] As opposed to each of a feeling quantity of state "kPaalpha, kPabeta, kPagamma", the amount of feeling experiences "kIalpha, kIabeta, kIagamma", and feeling variation "kDaalpha, kDabeta, kDagamma" Since it is set up with "15, 0, 10", "6, 0, 4", and "5, 0, 5", these numeric values are substituted for the above-mentioned formula (10), and it will be set to "390" if it asks for activity consideration on-the-strength Malpha which receives "it being glad". [of activity] Similarly, the activity consideration reinforcement of M gamma to which activity consideration on-the-strength Mbeta which receives activity "is absent-minded" receives "it aping" from "0" and a formula (12) is computed with "285" from a formula (11), respectively. [of activity]

[0071] If processing is performed from these numeric values according to the flow chart of drawing 6 which shows the determining condition of activity, first, it shifts to step S600, and it is "390", and since the maximum activity consideration reinforcement is not less than 200, it will shift to (No) and step S602. If it shifts to step S602, since the activity consideration reinforcement of mimicry will be "285" and will become less than 550 (Yes), it shifts to step S608.

[0072] If it shifts to step S608, activity consideration reinforcement will be determined as activity which makes a pet mold robot perform "it being glad", and will end processing. [of the activity which is max] And the information on the determined activity is

transmitted to the activity activation section, for example, when a pet mold robot is a dog, it performs actuation "with which it is pleased" of "***ing a tail."

[0073] Here, the activity determining condition of drawing 6 is called and performed by the subprogram S2 as a subprogram S3. Furthermore, a pet mold robot's circumference information and self-information are detected at step S200 like the above, and the case where two, "gesture could be seen", are extracted as description information at step S202 is explained. ["people being seen" and] In this case, as for "it being glad and "man being seen to sadness"", "+15, -30" receive "gesture could be seen" from drawing 5 , and "+200, -500", and a value are read from feeling quantity of state database 5a (step S300). [of feeling] Therefore, a main program performs a subprogram S1 and computes "0" as a feeling quantity of state Pb of "215" and "sadness" as a feeling quantity of state Pa of "joy" according to a formula (1) and (2), respectively. In the gestalt of this operation here, since Pa at present and Pb serve as newest feeling quantity of state as memorizing three feeling quantity of states until feeling quantity of state storage 6a results from the past in front of two now for every feeling, feeling quantity of state storage 6a will memorize as Pa3 and Pb3 (step S302).

[0074] The amount Pa of feeling experiences of "joy" the feeling quantity of state computed before one as Pa2 and Pb2, respectively and the feeling quantity of states Pa1 and Pb1 in front of "15", "0", and two Since it is set to "0" which is both initial value, a main program A subprogram S2 is performed, these values are read, according to a formula (3) and (4), "230" is computed as an amount Ia of feeling experiences of "joy", and "0" is computed as an amount Ib of feeling experiences of "sadness", respectively (steps S400-S402). Furthermore, from "15" which is the feeling quantity of states Pa2 and Pb2 in front of one, and "0", according to a formula (5) and (6), "200" is computed as feeling variation Da of "joy", and "0" is computed as an amount Db of feeling experiences of "sadness", respectively (step S404). Therefore, if it receives "he is glad [of activity / "glad"], and absent-minded", and "it aping" and activity consideration reinforcement is computed according to formula (7) - (9) from the feeling multiplier shown in the above-mentioned feeling quantity of state, the amount of feeling experiences, feeling variation, and drawing 7 , "5375", "0", and "4070" will be computed, respectively (step S406).

[0075] Based on these numeric values, a main program performs a subprogram S3 and it shifts to step S600 first, and it is "5375", and since the maximum activity consideration reinforcement is not less than 200, it shifts to (No) and step S602. If it shifts to step S602, the activity consideration reinforcement of mimicry is "4070", and since it becomes 550 or more, it will shift to (No) and step S604.

[0076] If it shifts to step S604, it will determine as activity which makes a pet mold robot perform "it apes", and processing will be ended (step S408 - step S410). And the information on the determined activity will be transmitted to the activity activation section, and a pet mold robot will ape the "gesture" which the person reflected in camera 2a performed in this case.

[0077] moreover -- "-- a favorite person -- near -- it is -- " -- and, when "struck by the man" If the change value of a feeling quantity of state whose change value of the feeling quantity of state of "joy" and "sadness" denies and suits is set up, respectively so that a synthetic feeling quantity of state may become a value near "0" Since activity consideration reinforcement serves as a small value as a result and the maximum activity

consideration reinforcement in the flow chart of drawing 6 which is the setups at the time of activity decision becomes easy to become less than 200, "he is absent-minded" becomes it is easy to be chosen as activity. [it]

[0078] And if a feeling quantity of state is accumulated in feeling quantity of state storage 6a, the amount of feeling experiences will participate in the decision of activity consideration reinforcement greatly. For example, when the amount of feeling experiences of "joy" is a big value, supposing a big change arises in the feeling quantity of state of "sadness" at present, the condition of "joy" of a just before will affect the calculation result of the activity consideration reinforcement by formula (7) - (9) with the amount of feeling experiences of a big numeric value. Numerically, even if the feeling quantity of state of "joy" is [the feeling quantity of state of "sadness"] "50" in "0" in this time, the feeling quantity of states Pa1 and Pa2 of "joy" before two are "70" and "50" from this time, respectively. When the feeling quantity of states Pb1 and Pb2 of "sadness" are "0" and "0", respectively Since the amount of feeling experiences of "joy" is set to "120" and the amount of feeling experiences of "sadness" is set to "50" Among the feeling multipliers set up for every activity, to the thing to the amount of feeling experiences of each feeling which has a big feeling multiplier, in order to take the integrated value, it will have big effect on the numeric value of activity consideration reinforcement.

[0079] Furthermore, when it was a big value and the threshold which the effect which it has on activity consideration reinforcement becomes large, for example, has this value is exceeded like [feeling variation] the amount of feeling experiences So that special activity may be determined set up conditions or Or by the feeling variation of specific feeling being less than a certain value, and the feeling quantity of state of other feeling being conspicuous, when it is not a big value The device of making a pet mold robot perform actuation to which the action is urged etc. is also possible so that a user may perform action to which the specific feeling quantity of state rises. In a dog type pet mold robot the feeling of "joy" for example, this feeling variation with a small value as specific feeling And when there is nothing of a conspicuous value to which the feeling quantity of state of other feeling influences the decision of activity A pet mold robot is made to do actuation which he wants to carry out action a user, such as approaching a user with a swing in a tail, raises [action] the feeling quantity of state of "joy" of "it strokes" etc. involuntarily, and becomes.

[0080] Next, an example of the gestalt of the operation which has the function which updates a feeling multiplier as a gestalt of operation of the 2nd of this invention in addition to the gestalt of implementation of the above 1st is explained based on the flow chart which shows an update process of the feeling multiplier of drawing 8. In addition, the part which overlaps the gestalt of implementation of the above 1st omits explanation, and explains only an update process of a feeling multiplier. First, the case where this invention is applied to the pet mold robot of a dog by which "a tail is wagged" and "stability is carried out" were set up as activity, and "joy" and "sadness" were set up as feeling is explained. Here, when the feeling quantity of state of this feeling exceeds a threshold by making "joy" of feeling into specific feeling as updating conditions for a feeling multiplier, the increment in the specified quantity of the multiplier value over the feeling of "joy" of the feeling multiplier set up to this activity will be carried out by making "to wag a tail" into specific activity. [of activity]

[0081] If renewal of a feeling multiplier is performed for every predetermined period and it becomes the period, as shown in drawing 8, it will shift to step S800 first. And the feeling quantity of state of "joy" at present determined by feeling quantity of state decision section 5b is compared with the set-up threshold, when it judges and is over whether the feeling quantity of state of "joy" is over the threshold (Yes), it shifts to step S802, and when having not exceeded, (No) ends processing and is returned to the original processing.

[0082] When it shifts to step S802, and the increment in the specified quantity of the multiplier value over the feeling of "joy" of the feeling multiplier set up for "wagging a tail" is carried out and a feeling multiplier is updated, a series of processings are ended and it is made to return to the original processing. Therefore, if the condition that the feeling quantity of state of "joy" exceeds a threshold continues for a long time, it will come to opt for the actuation the activity consideration reinforcement computed by receiving "a tail is wagged" serves as a gradually big value, and it "wags a tail" even if the value is not so big. [as opposed to / henceforth / the feeling quantity of state of "joy"]

[0083] furthermore -- as activity -- "throat -- a grounder -- a grounder -- the case where it applies to the pet mold robot of a cat by which *****" and "***** is turned to" were set up, and "joy" and "sadness" were set up as feeling is explained. the time of the feeling quantity of state of this feeling exceeding a threshold by making "joy" of feeling into specific feeling like the pet mold robot of the above-mentioned dog as updating conditions for a feeling multiplier here -- "throat of activity -- a grounder -- a grounder -- specified-quantity reduction of the multiplier value over the feeling of "joy" will be carried out by making *****" into specific activity. [the feeling multiplier set up to this activity]

[0084] First, if a predetermined period comes, the feeling quantity of state of "joy" determined by feeling quantity of state decision section 5b is measured with a predetermined threshold. the case where it is over the threshold -- step S802 -- shifting -- "throat -- a grounder -- a grounder -- specified quantity reduction of the multiplier value over the feeling of "joy" of the feeling multiplier set up to *****" is carried out, a series of processings are ended, and it is made to return to the original processing

[0085] As opposed to *****" if the condition that the feeling quantity of state of "joy" [therefore,]" exceeds a threshold continues for a long time -- "throat -- a grounder -- a grounder -- activity consideration reinforcement It becomes a gradually small value. The feeling quantity of state of "joy" and "sadness" both at for example, the same time of a value "throat -- a grounder -- a grounder -- if the multiplier value of "joy" of *****" is a small value, since activity consideration reinforcement will serve as a small value, the probability which is another activity for "turning to *****" to be determined becomes high.

[0086] The activity decision equipment 1 concerning this invention as mentioned above, with circumference information detection equipment 2 The visual information and speech information of a controlled system are detected. With moreover, self-information detection equipment 3 The contact information on an object over a controlled system is detected. By and the description information extract section 4 Since it becomes possible to set up the change value of the quantity of state of the feeling set as the controlled system by extracting the description information to the description information on the

ability "for gesture to have been able to be seen", ["people are seen",] It is possible to set up the condition of deep feeling that the circumference information and self-information of a controlled system were reflected, by setting up much description information to which feeling is changed.

[0087] Moreover, while expressing each condition of all the feeling of a controlled system for three numeric values, a feeling quantity of state, the amount of feeling experiences, and feeling variation The feeling multiplier which connects the activity which sets up the change value so that the direction of strong feeling may serve as a big numeric value from weak feeling according to the strength of the feeling in the condition of the feeling at that time, and is beforehand set as the controlled system, and each feeling, Since the activity which computes activity consideration reinforcement and a controlled system is made to perform by the calculation result from a feeling quantity of state, the amount of feeling experiences, and feeling variation is determined The activity in which the information on the variation from the condition of feeling at present, the condition of feeling until it results [from the past] in current, and the predetermined past of a feeling quantity of state to current was reflected will be determined as activity which a controlled system is made to perform, and the decision of the suitable activity to a complicated feeling condition is attained.

[0088] Moreover, since predetermined conditions are set up at the time of the decision of activity, the thing of a numeric value for example, with the largest activity consideration reinforcement is opted for setting out of this condition as activity, and, in addition to this condition, a predetermined threshold is established like drawing 6 , the comparison with the activity consideration reinforcement to specific activity and its threshold is also performed, and it becomes possible to determine activity etc. Moreover, a user's interest is lengthened and setting out of conditions with which it is not made to get bored of specific activity being determined or setting up the activity suddenly generated in the probability for it to be low when the numeric value is in a high condition to specific activity or feeling, if specific conditions with difficult your making it materialized are satisfied with devising setting out of conditions, for example etc. is attained.

[0089] Moreover, since he is trying to update the feeling multiplier to specific activity when the feeling quantity of state of specific feeling is over the predetermined threshold, when updating with the inclination which increases a feeling multiplier By specific activity becoming is easy to be determined to specific feeling, and decreasing a feeling multiplier Since it is made for specific actuation to become being hard to opt to the action which raises the specific feeling which a user repeats, the increment in a feeling multiplier is received. Characterization by the controlled system will be performed and the "habituation" to the repeat of the same stimulus of a controlled system will be set up to reduction of a feeling multiplier. Therefore, the decision of the activity to change of the feeling of a controlled system is controlled by updating a feeling multiplier under predetermined conditions, and it becomes possible to attach the description to the decision of the activity to change of feeling.

[0090] Here, circumference information detection equipment 2 and self-information detection equipment 3 correspond to a controlled-system circumference information detection means according to claim 1 and a controlled-system self-information detection means, respectively, and process step S200 of drawing 2 . Moreover, the feeling quantity of state decision section 5 corresponds to claim 1 and a feeling quantity of state decision

means according to claim 2, and processes the subprogram S1 (step S300 - step S302) of drawing 3 . And activity decision equipment 6 corresponds to claim 1 and a controlled-system activity decision means according to claim 3 to 13, and processes an update process (step S800 - step S802) of drawing 4 , drawing 6 and the subprogram S2 (step S400 - step S410) of drawing 8, a subprogram S3 (step S600 - step S608), and a feeling multiplier.

[0091] In addition, although a feeling quantity of state, the amount of feeling experiences, and feeling variation are computed and activity consideration reinforcement is computed using the all, activity consideration reinforcement may be computed using two combination, not only this but arbitration, and you may make it compute in the gestalt of the above-mentioned implementation only using any one. In this case, although the properties reflected in activity by each combination differ, when you want to simplify control, or when not accomplishing semantics [that numeric value], it is removing from combination, and is also that the cost is cut down by suppressing a useless operation and changing to low price CPU.

[0092] Moreover, in the gestalt of the above-mentioned implementation, although above-mentioned formula (1) - (12) was used for calculation of a feeling quantity of state, the amount of feeling experiences, feeling variation, and activity consideration reinforcement, what kind of formula may be used in the range which does not deviate from the main point of not only this but this invention. Moreover, although the activity determining condition of drawing 6 has determined the actuation which a controlled system is made to perform with the gestalt of the above-mentioned implementation, what kind of conditions may be set up in the range which does not deviate from the main point of not only this but this invention.

[0093] Moreover, in the gestalt of the above-mentioned implementation, although the feeling set as the controlled system was only two, "joy" and "sadness", not only in addition to this but such feeling, the "resentment", "fear", "surprise", "dislike", etc. may set up other feeling. Moreover, in the gestalt of the above-mentioned implementation, although he is trying to memorize three feeling quantity of states until it results [from the past in front of two] in current to each feeling, a feeling quantity of state until only the part of the storage capacity of not only this but storage results [from the past] in current is memorized, all they may be used for an operation or only the range of desired may be used for an operation.

[0094] moreover, as color information is detected, in case a controlled system performs activity on the basis of the object of a user, a ball, etc. as circumference information in the gestalt of the above-mentioned implementation You may make it carrying out actuation "which bends backward" in consideration of the color information on an object, if an object is a disagreeable color, or carrying out actuation "skipped and attached", if an object is a favorite color etc. also take color information into consideration to the decision of activity.

[0095] Moreover, the feeling magnitude of attenuation is set up and you may make it each feeling decline in the gestalt of the above-mentioned implementation based on the set-up numeric value with the passage of time. In this case, since setting out of the feeling which cannot fall easily once a numeric value goes up etc. is attained, setting out in the feeling condition of changing to real time is attained. Moreover, it also becomes possible to, carry out characterization characteristic of a pet mold robot etc. by changing this set

point for every controlled system for example.

[0096] Moreover, in the gestalt of the above-mentioned implementation, a feeling multiplier may be updated, when you may make it update when not only a feeling quantity of state at present but the amount of feeling experiences or feeling variation fulfills predetermined conditions, and the sum of the combination of arbitration is over the predetermined threshold among a feeling quantity of state at present, the amount of feeling experiences, and feeling variation. Moreover, in the gestalt of the above-mentioned implementation, although renewal of a feeling multiplier is performed only to change of the feeling quantity of state of specific feeling Not only this but when the light-and-darkness information on surrounding, atmospheric temperature information, etc. are detected as circumference information, and predetermined conditions are established to these, for example, darkness continues for a long time When the feeling multiplier to "fear" etc. is decreased, and you may make it update the feeling multiplier to the feeling relevant to detection information and detection of a "hungry" condition is carried out only as circumference information, for example, self-information, although reaction actuation of ["be / it / hungry"] is returned, usually When this condition continues for a long time, predetermined conditions are established and you may make it update a feeling multiplier also to self-information, such as decreasing the feeling multiplier to this reaction actuation, and making it this reaction actuation become is hard to perform etc.

[Translation done.]

*** NOTICES ***

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of activity decision equipment 1.

[Drawing 2] It is the flow chart which shows processing of the main program which performs the whole motion control of operation.

[Drawing 3] It is the flow chart which shows processing of the subprogram S1 which determines a feeling quantity of state of operation.

[Drawing 4] It is the flow chart which shows processing of the subprogram S2 which determines activity consideration reinforcement of operation.

[Drawing 5] It is the conversion table of the change value of a feeling quantity of state to the description information.

[Drawing 6] It is the flow chart which shows processing of the subprogram S3 which

determines activity of operation.

[Drawing 7] It is the conversion table of a feeling multiplier to the set-up activity.

[Description of Notations]

- 1 Activity Decision Equipment
- 2 Circumference Information Detection Equipment
- 3 Self-information Detection Equipment
- 4 The Description Information Extract Section
- 5 Feeling Quantity of State Decision Equipment
- 6 Controlled-System Activity Decision Equipment

[Translation done.]

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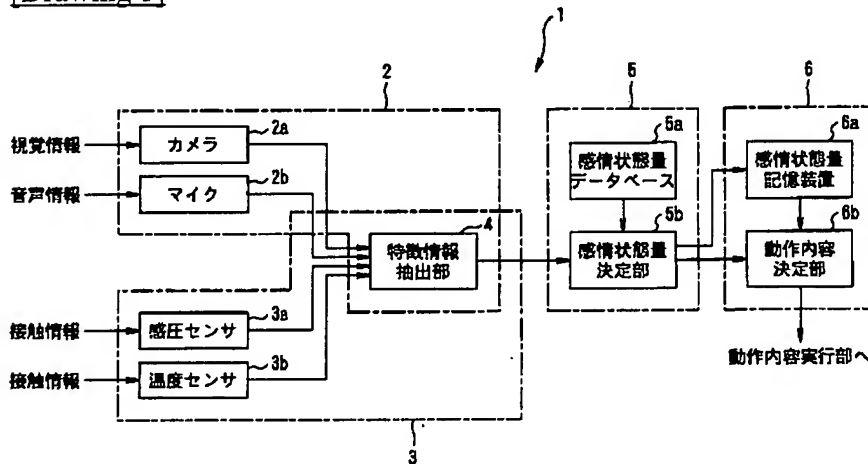
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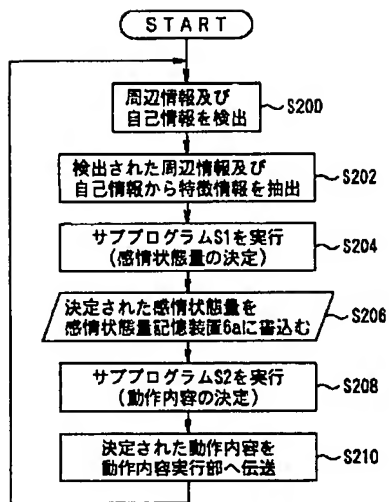
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DRAWINGS

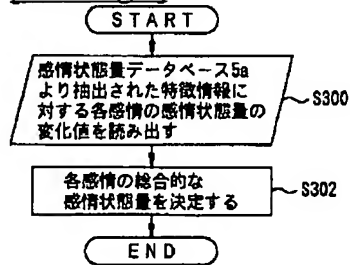
[Drawing 1]



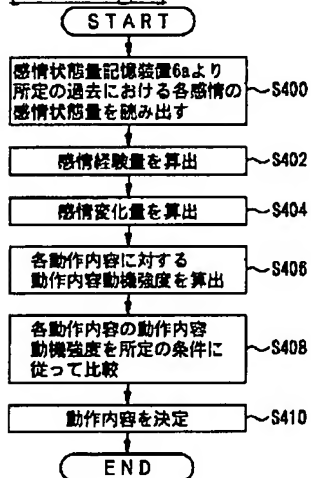
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Drawing 5]

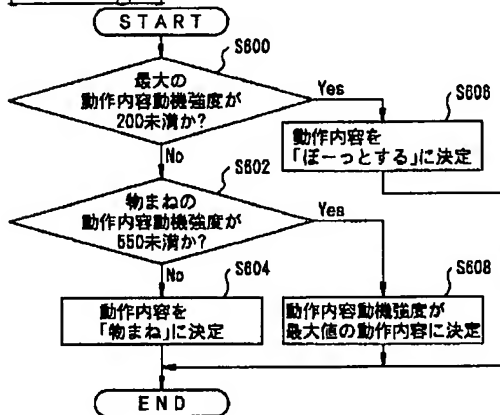
特徴情報に対する感情状態量の変化値決定表

	人が見える	振で	叩き	大きい音	ジュースが飲えた	熱い	冷たい
喜び	15	500	-250	-200	200	-100	-100
悲しみ	-30	-500	1000	300	-500	50	50

[Drawing 7]

	現時点の感情状態量		感情経験量		感情変化量	
	喜び	悲しみ	喜び	悲しみ	喜び	悲しみ
喜ぶ	15	-5	6	-4	5	-5
ぼーっとする	0	0	0	13	0	0
物まねをする	10	-10	4	-4	5	-5

[Drawing 6]



[Translation done.]